EU - Russia Energy Interdependence: Geopolitical Challenges, Perspectives & Recommendations for a Long-Term EU Energy Security Strategy

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I hereby declare that the work submitted is mine and that where I have made use of another's work, I have attributed the sources according to the Regulations set in the Student's Handbook.

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Abstract

This dissertation was written as a part of the “MSc in Energy Law, Business, Regulation and Policy” at the International Hellenic University. Energy security is currently one of the most disputed issues between the European Union (EU) and Russian Federation (Russia). Their energy trading relationship can be characterized as a “necessary evil” for both. Neither, EU feels comfortable, being highly dependent on energy imports from third countries, let alone when it is Vladimir Putin's Russia, nor Russia feels comfortable, being highly dependent on the energy exports-revenues to the Pro-American EU. From EU’s perspective, having experienced the consequences of 2006 and 2009 gas crises, Russia’s position as a reliable partner-supplier is considered as questionable, leading the EU to accelerate its energy diversification and liberalization efforts to decrease its dependency on Russian hydrocarbons. On the other hand, from Russia’s perspective, the above EU attempts, along with the growing Liquefied Natural Gas (LNG) market are considered as a threat for Russia’s domination over European energy market.

This thesis aims apart from analysing the phenomenon of the interdependence between EU-Russia and its impact on the EU energy security, to propose a long-term EU energy strategy based on: (i) the diversification of the energy supply by exploiting “taboo” energy sources, such as shale fossil fuels and nuclear energy and (ii) the development of new interconnections linked with new LNG regasification facilities, especially in the littoral EU Member States located in the Baltic, Adriatic and Black Sea, in order to provide flexibility and liquidity regarding the energy supply of both littoral and landlocked Central, Eastern and Baltic Member States, decreasing their dependence on Russian hydrocarbons. The thesis concludes that there is a crucial need for a common EU energy policy, according to which, the EU would negotiate with one voice *vis-à-vis* third countries such as Russia. EU must undertake such a strategy not only because over-reliance on any one supplier-source represents unsound policy, but more importantly because Europe’s dependency on Russian energy already profoundly threatens the sovereignty of certain Member states. On the other hand, Russia should carry out needed reforms internally and stop aggression outside its borders because its current energy foreign policy threatens its economy’s viability.

Keywords: energy, geopolitics, interdependence, security, strategy

Alexandros Dimitrios Nalmpantis

Thessaloniki, 30.01.2017

Preface

This dissertation is original, unpublished, independent work by the author, Alexandros Dimitrios Nalmpantis.

At this point, I would like to thank my thesis advisor Professor Dr. Sandro Furlan of the School of Economics, Business Administration & Legal Studies at International Hellenic University. He consistently allowed this paper to be my own work, but he also guided me with his valuable comments wherever he thought I needed.

Finally, I take the opportunity to express my gratitude to my family for their love, unfailing encouragement, and support.

I hope you enjoy your reading.

Alexandros Dimitrios Nalmpantis
Thessaloniki, 30.01.2017

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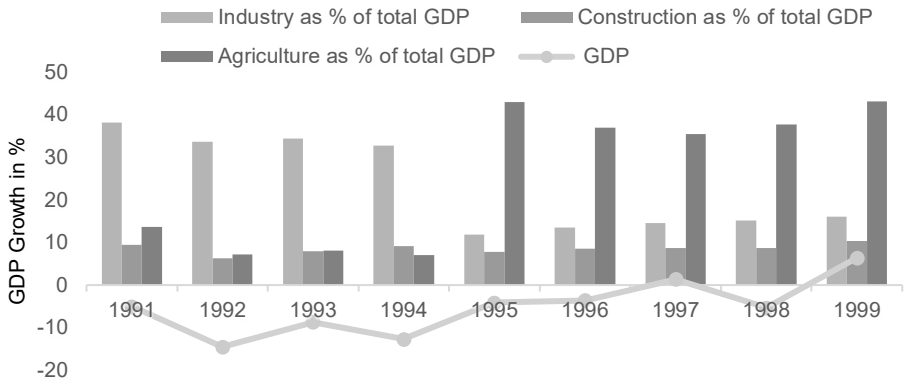
1. Introduction

This thesis focuses on the drafting and interpretation of the interdependence between European Union (EU) and Russian Federation (Russia) and how this interdependence impacts on EU energy security of supply. Reading the following analysis, someone could deeply understand how the conflicting geopolitical-economic interests of EU and Russia can affect their trading relationship regarding both the viability of their economies and their energy security, as they are of the strongest international actors defining the global economy's trends and hence the life of each of us. Regarding, the study and analysis of the current topic, a bibliographic method-approach is adopted, based on the literature and the documentation of the validity of these sources with the contribution of reliable statistical graphs and tables.

With regard to the structure of this thesis, Chapter 2 contains an analysis of the detrimental consequences in economic and social level that Russia experienced due to the collapse of the Soviet Union. This chapter serves to highlight the profound effect of Soviet Union's dissolution on Russia's foreign policy that persists until today, helping us to understand the vital importance of energy exports revenues both for the viability of Russian economy and its national security. Subsequently, Chapter 3 is divided into three sections. In the first one, there is a briefly presentation of the Russian energy sector based on variety of significant statistical data, to get familiar with Russia's energy industry's current situation and trends. The second section of this chapter presents the Russia's coercive use of its energy resources as geopolitical weapon ("Pipeline Politics") against neighbouring ex-Soviet states which consists a lasting threat for the EU's security of supply. Finally, third section refers on the Russia's answer to the current geo-political challenges (i.e. US LNG, EU supply diversification and liberalization efforts, tense diplomatic relations with transit states such as Ukraine) threatening Russia's energy domination's over European market). Subsequently, Chapter 4 focuses on the impact of Russian-Ukrainian crisis of 2014 on the definition of the EU energy security strategy, giving emphasis on the intended diversification efforts -on behalf of EU- regarding the energy transport routes, supplier-source countries and energy types. Last but not least, Chapter 5 proposes a long-term EU energy strategy based on: (i) the diversification of energy supply by exploiting "taboo" sources, such as shale fossil fuels and nuclear energy and (ii) the construction of new pipeline interconnectors and LNG regasification facilities. Finally, the thesis draw a conclusion, focusing on the crucial need for a unified EU energy policy, according to which, the EU would negotiate with one voice *vis-à-vis* third countries such as Russia.

2. Post-Soviet era shock & the vital importance of energy to the Russian economy

The collapse of the Soviet Union (USSR) introduced one of the most important social-political divisional section in the world history. It vanished the threat of nuclear war that had hung over the world during the "Cold War", marking a new era in which capitalism prevailed in global consciousness as the sole viable economic system and the USA - as the main representative of capitalist ideals - emerged as the undisputed world-superpower. At the same time, Russia suffered in the aftermath of the collapse of the USSR the severe economic turmoil during the transition from a centrally command economy to a free globally integrated market economy (see Figure 1 and Figure 2). [1]



Source: GDP data retrieved from IMF (2015). World Economic Outlook Database and the other data retrieved from Gavrilenkov and Izryadnova (2003)

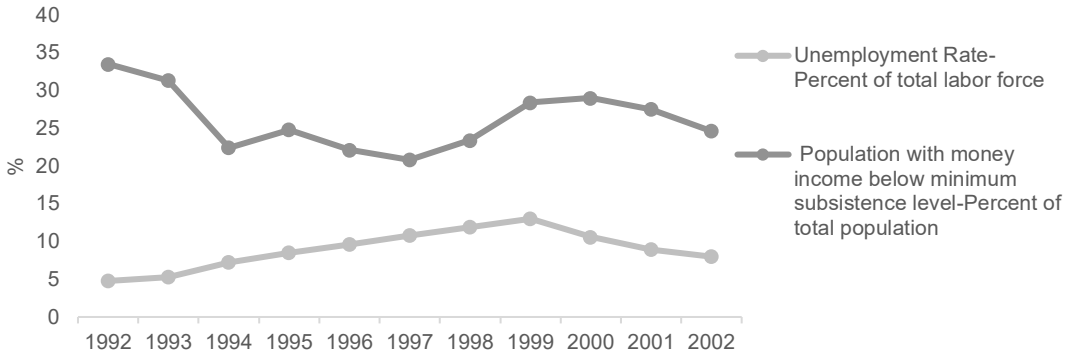
Figure 1: Behaviour of Russian Gross Domestic Product (GDP) and the production of goods as % of total GDP: 1991-1999.

Table 1: Variations in estimates of capital flight from Russia: 1991-1997 (in billion U$D)

Variations in estimates of capital flight	1991	1992	1993	1994	1995	1996	Total
Minimum	1.0	2.5	5.0	2.5	5.0	10.0	26
Medium	8.2	13.0	8.0	17.0	12.0	12.0	70.2
Maximum	15.5	20.0	17.0	42.4	30.0	24.0	148.9

Source: Tikhomirov (2000)

[1] President Yeltsin's program of radical - market-oriented reform known as a "shock therapy", resulted in a major economic crisis, characterized by round 50 % decline in Russian GDP between 1991-1996 due to both the significant reduction in industry output (see Figure 1) and the huge capital flight (see Table 1).



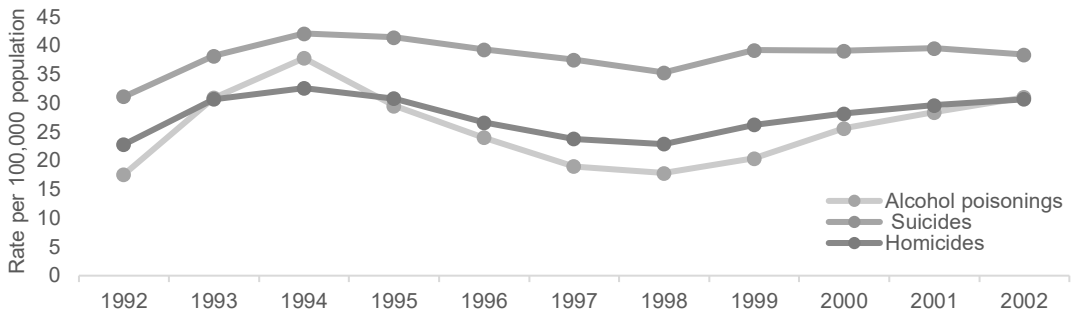
Source: Russia Federal Statistics Service (2015)

Figure 2: Social indicators of the Post-Soviet Russia: 1992-2002.

It should be stressed that the reference to the collapse of the USSR and its detrimental consequences in economic and social level that Russia experienced, serves to highlight the profound effect of them on Russia's foreign policy that persists until today. The sense of "being vulnerable", as a side effect of the socioeconomic shock caused by the collapse of the Soviet regime, continues until today to determine Russia's national energy security strategy. Since USSR's dissolution, energy resources became Russia's key method for restoring its economy, military capabilities, and geopolitical status (Bugajski, 2004).

At this point, it would be useful for the following analysis to define first the term of national security and then examine the Russian perception of its own national security. National security as a concept encloses the vital need to ensure the survival and prosperity of the state using economic-politic power, diplomacy, and power projection (Baldwin, 1997). Ensuring national security also implies both economic and energy security. In case of Russia, we notice that both the Russian political elite and the population[2] felt insecure and isolated during the first decade after the collapse of the USSR.

[2] Millions plunged into poverty, from a level of 1.5 % of total population in the late Soviet era to 33,5 % by 1992 (see Figure 2) resulted in Russia's official request to the United Nations for international humanitarian food aid (Milanovic, 1998). The period of 1990s was also marked by extreme corruption, the rise of criminal gangs (Siegel, 2004) and the considerable increases in the alcohol related deaths, suicides and homicides. (WHO, 2006 - see Figure 3).

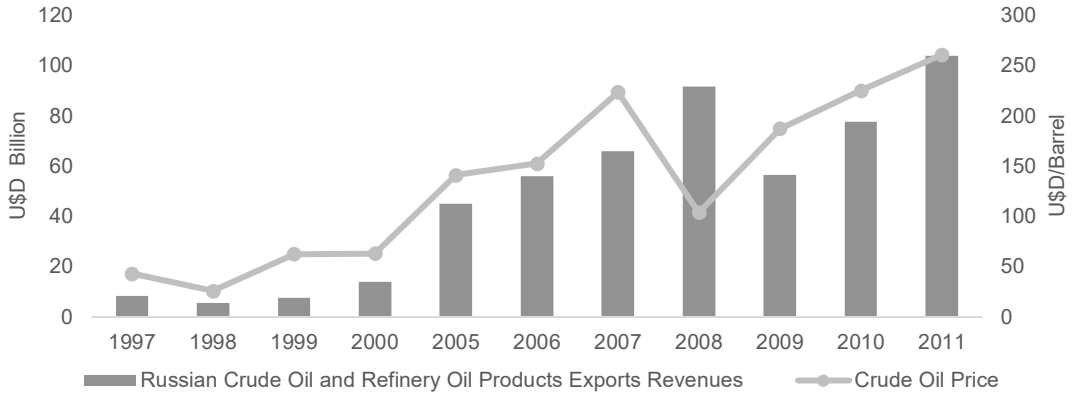


Source: Russia Federal Statistics Service (2015)

Figure 3: Alcohol poisonings, suicides and homicides in Post-Soviet Russia: 1992-2002

It is important to understand that the crisis felt Russia during the first decade after USSR's dissolution has also to do with remarkable historical events occurring during the same relative period, which dramatically increased the sense of national insecurity, defining both internal and external policy of Russia in the coming decades. To be more specific, the 1998 economic crisis and collapse of the Russian ruble, [3] the internal conflict in Chechnya,[4] and the expansive military presence of Russia's former military rival (North Atlantic Treaty Organisation (NATO) in the Balkan region[5] contributed to feel the Russians economically and militarily threatened both from abroad and internally. Regarding the most important reason for the economic insecurity deriving from the Russian economic crisis in 1998, we should focus on the reducing demand and thus price of the exported crude oil and nonferrous metals, resulting from the Asian economic crisis began in 1997, which severely impacted Russian foreign exchange reserves[6] (Gaidar, 2004). The decline in Russian crude oil exports revenues alone from 1997 (21,1 U$D billion) to 1998(14 U$D billion) was nearly 66 % (see Figure 4).

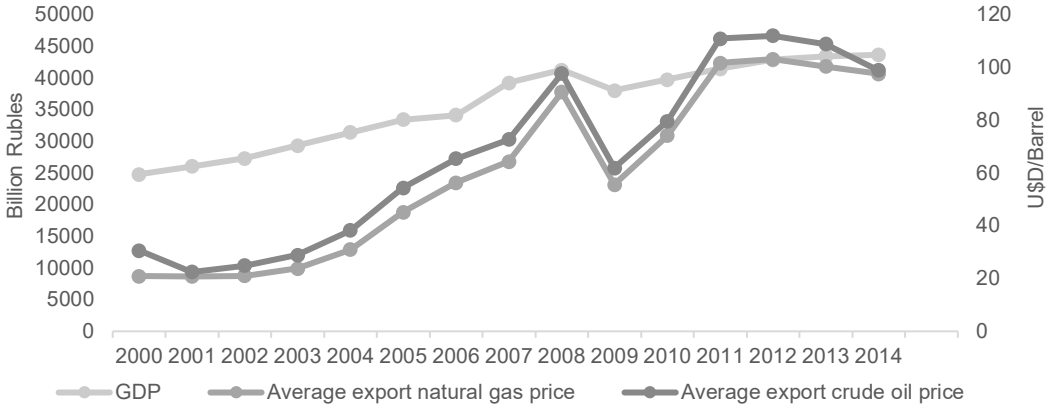
[3] Declining productivity, a high fixed exchange rate between the ruble and foreign currencies and a chronic fiscal deficit were the reasons that led to the crisis (Chiodo and Owyang, 1998).
[4] From the time, Chechen separatists declared independence in the early 1990s, an intermittent guerrilla war has been fought between the rebel groups and the Russian military (Curtis, 1996).
[5] On 24 March 1999, despite Russian opposition to Western involvement in Kosovo, NATO began its bombing campaign in Federal Republic of Yugoslavia (Roberts, 1999).
[6] The Central Bank of Russia was forced to defend the ruble, spending 6 U$D billion of their foreign exchange reserves. At the same time as the ruble was under attack, the price of oil and non-ferrous metals began to drop, reducing Russia's hard-currency earnings by two-thirds (Chiodo and Owyang,1998).



Sources: Russian crude oil and refinery oil products revenues data retrieved from Kang and Park (2015) and crude oil prices data retrieved from: http://www.indexmundi.com/commodities/?commodity=crude-oil&months=300

Figure 4: Behaviour of crude oil price and the Russian crude oil and refinery oil products exports revenues: 1997-2011.

The economic situation in Russia began to improve by the end of 1999 with the gradual increase in demand for Russian oil and gas exports. According to Sabitova and Shavaleyeva (2015), during 2000-2008 period, the GDP increased round 1.7 times, while average export oil prices 3.2 times and the average gas prices 4.3 times. The Russian economy, which had averaged 7 % growth during 1998-2008 as oil prices rose rapidly, has seen diminishing growth rates since then due to the exhaustion of Russia's commodity-based growth model. In the course of crisis 2009, both the average export oil prices and the average gas prices dropped 1.6 times while the GDP decreased by 7.8 %. The behaviour of Russian GDP and the average export prices for oil and gas is presented below (see Figure 5).

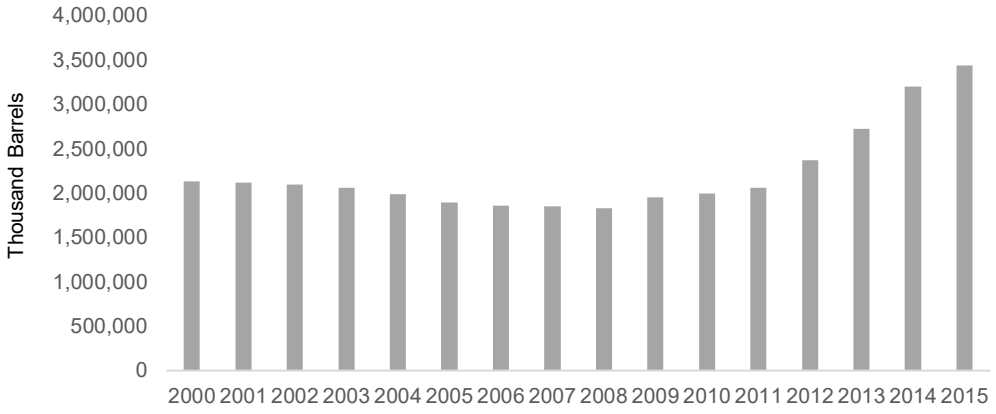


Source: Sabitova and Shavaleyeva (2015)

Figure 5: Behaviour of Russian GDP and the average export gas and crude oil prices: 2000-2014.

After a brief period (2010-2012, see Figure 5), when oil and gas average prices increased round 1,8 times since 2008 crisis, the oil and gas prices[7] began falling again. The drop in oil prices was caused by a drop in the demand for oil across the world, as well as increased oil production in the United States (Mooney, 2014). Thanks to the booming shale oil revolution taking place in states like North Dakota and Texas, oil production in the USA has increased for the period 2009-2015 by 37,5 % (see Figure 6).

The fall of Russian ruble beginning in the second half of 2014, caused by a combination of falling oil prices (from U$D 111,87 per barrel in June 2014 to U$D 62,16 per barrel in December 2014, declined nearly 55 % - EIA, 2015), economy's structural limitations and international sanctions following Russia's annexation of Crimea, resulted in pushing Russian economy into a deep recession in 2015, with the GDP falling by close to 4 % driving a 9.5 % decline in real wages (Luhn, 2016). The economic recession has led 2.3 million Russians fell into poverty in the first nine months of 2015. (Moscow Times, 2015). As a result, Russians' despair has grown. Even a rising number of small, local protests have occurred (Friedman, 2016).



Source: US Energy Information Administration (2016)

Figure 6: U.S. field production of crude oil: 2000-2015.

The fall in oil prices hit Russia hard, as roughly half of the Russia's governmental revenue in 2014 comes from the sale of oil and gas (Chung, 2014). Russia's economy suffers from "Dutch disease", a term economists use to describe a situation in which a country

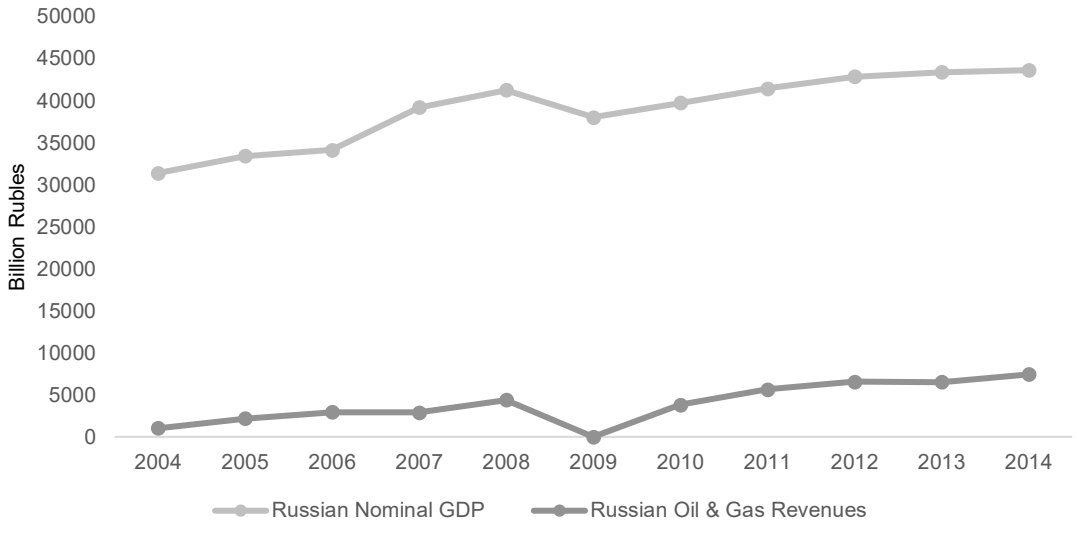
[7] Although once seen as the fair and secure way to value natural gas, oil-indexation has been losing ground as the dominant pricing method in Europe since 2014 (Theisen, 2014). Most recently, even Russia's Gazprom, the foremost advocate of oil-pegged gas prices, has yielded to pressure and decided to increase the share of spot pricing in its export portfolio (Reuters, 2015). We can notice that in every country that switched away from oil-indexation to a hub-spot pricing model, the price of gas for the end-consumer declined significantly (De Meulemeester, 2015).

focuses on developing its natural resources to the detriment of other economic activity (Coppola, 2014). The Kremlin - having learned a painful lesson in 2015 in a vain effort to determine its budget based on optimistic forecasts regarding the oil prices - is trying now to diversify the economy away from extractive-energy industries, becoming less dependent on energy export revenues, which now accounts for 37 % of all government revenues, compared to roughly 50 % in 2014 (Kottasova, 2016).The behaviour analysis of GDP and oil and gas revenues of Russia budget system suggests that their trends repeat in general (Table 2 and Figure 7).

Table 2: Russian oil and gas revenues in 2004-2014.

			Oil and gas		
Year	**Consolidated Revenues (bnR)**	**Federal Revenues (bnR)**	**Revenues (bnR)**	**Share of consolidated revenues (bnR)**	**Share of federal revenues (bnR)**
2004	5429.89	3428.87	1035.11	19.06	30.19
2005	8127.09	5127.23	2162.01	26.60	42.17
2006	10076.22	6278.89	2943.54	29.21	46.88
2007	12609.58	7781.12	2897.37	22.98	37.24
2008	15474.71	9275.93	4389.43	28.37	47.32
2009	13264.37	7337.75	2983.96	22.50	40.67
2010	14842.76	8305.41	3830.67	25.81	46.12
2011	19011.89	11367.65	5641.77	29.67	49.63
2012	20920.06	12855.54	6453.18	30.85	50.20
2013	21186.06	13019.94	6534.04	30.84	50.18
2014	23402.09	14496.83	7433.81	31.77	51.28

Source: Sabitova–Shavaleyeva (2015). Abbreviation: bnR= billion Rubles



Source: Sabitova and Shavaleyeva (2015)

Figure 7: Behaviour of Russian nominal GDP and oil and gas revenues: 2004-2014.

Having briefly highlighted the historical reasons for the economic-social insecurity experienced by Russia after the collapse of the Soviet regime and having analysed-

understood the vital importance of Russian energy export revenues for the viability of Russian economy and thus for its national security, we can examine later the relationship of energy interdependence between Russia and the EU and its influence upon the energy-economic security of both.

3. The strategic role of energy for the Kremlin's foreign energy policy

Formation of long-term energy policy began with the first step of Russia as an independent state. But in my opinion, we should focus on Vladimir Putin's presidency following his suspicious[8] and unexpected[9] rise to power in 1999, examining the phenomenon of "Putinism"[10] as a reference point in the definition and evolution of the Russian energy strategy as we know so far.[11] In his thesis, Putin discussed the importance of Russia's natural resource wealth in Russia's energy policy. He outlined his view of the appropriate role of the Russian state, and of vertically integrated financial - industrial groups, particularly in the oil and gas industry (Balzer, 2005). As president, Putin put into action the basic principles outlined in his thesis, effectively nationalizing the oil and gas industry in order both to ensure that the profits from energy exports would be used in favour of weak Russian economy. With the gradual increase in demand for Russian crude oil and the recovery of oil prices throughout 1999, Russian economy began to improve, giving the possibility to Putin to make his dream real by restoring gradually Russia's status as world-superpower. The improvement of the Russian economy thanks to the recovery of the Russian energy sector strengthened Putin's political power - "popularity", showing him as the undisputed guarantor of the security

[8] During September 1999, there were a series of explosions that hit four apartment blocks in the Russian cities of Buynaksk, Moscow and Volgodonsk, killing 293 and injuring more than 1000 people. There are allegations that the bombings were a "false flag" attack perpetrated by the Federal Security Service of Russia - known as FSB - to legitimize the resumption of military activities in Chechnya and bring Vladimir Putin to the presidency by contributing to the increase of his popularity among the feared population (Judah, 2013).

[9] On 31th of December 1999, Putin became acting President of the Russia upon the sudden resignation of President Yeltsin. It is claimed that when Yeltsin realized that if the opposition comes to power, it will be at high risk of prosecution chose Putin as his successor provided that the latter would guarantee for him immunity from prosecution (Judah, 2013).

[10] The ideology, priorities, and policies of Vladimir Putin are sometimes referred to as "Putinism".

[11] "Energy Strategy of the Russia until 2020"-approved in 2003, updated in 2009 and prolonged for the period up to 2030, rightly stated that the energy sector "*has a determining influence on the state and prospect of development of the national economy" (*Ministry of Energy of the Russian Federation,2010).

and cohesion of a vast newly-wounded state, characterized by profound social inequalities and cultural-ethnic differences within.

3.1. Presenting Russian energy sector's situation & trends

Energy proved reserves: Russia possesses the first place (17.3 % - see Table 3) regarding the share of world total proved gas reservoirs. The majority of those reserves are located in West Siberia (EIA, 2016). [12] In terms of coal, Russia (17.6 %) comes second after the USA, which holds nearly a third (26.6 %) of the earth's coal reservoirs (see Table 3). On the other hand, Russia possesses 'only' 6 % (see Table 3) of the planet's oil reservoirs, i.e. the oil reserves of Middle East are almost 8-fold that of Russia (47.3 %) and they are feasibly accessible unlike the remote fields in vast Russia (BP, 2016). Most of Russia's proved oil reserves are located in West-Siberia, between the Ural Mountains and the central Siberian Plateau, and in the Urals-Volga region extending into the Caspian Sea. In the longer term, reserves located in East Siberia, Russian Far East (Sakhalin Island) along with the largely unexploited reserves in Russian Artic will significantly increase the total Russian oil output (EIA, 2016).

Table 3: Russia's energy sector's general overview 2016.

	Proved Reserves		Production		Consumption		Export potential
Prime natural resources	Deposits	World total %	Quantities	World total %	Quantities	World total %	
Gas	32.3 tcm	17.3	573.3 bcm	16.1	391.5 bcm	11.3	181.8 bcm
Oil	14.0 tmt	6.0	540.7 mt	12.4	143.0 mt	3.3	397.7 mt
Coal	157010 mt	17.6	184.5 mtoe	4.8	88.7 mtoe	2.3	95.8 mtoe

Source: BP statistical review of world energy (2016). *Abbreviations:* tcm = trillion cubic metres; bcm = billion cubic metres; tmt = thousand million tons; mt = million tons; mtoe=million tons of equivalent

Energy production: In 2008, Russia was the world's largest gas supplier (19.6 %), the second largest oil (12.1 %) producer after Saudi Arabia (13.1 %) and the 6th largest coal producer (4.6 %) (BP, 2009). Back in 2008, Vladimir Putin looked close to realizing his vision of turning Russia into an energy superpower. Gazprom had become the world's third company regarding its market value[13] and European dependence of Russian energy supplies looked set to grow[14].

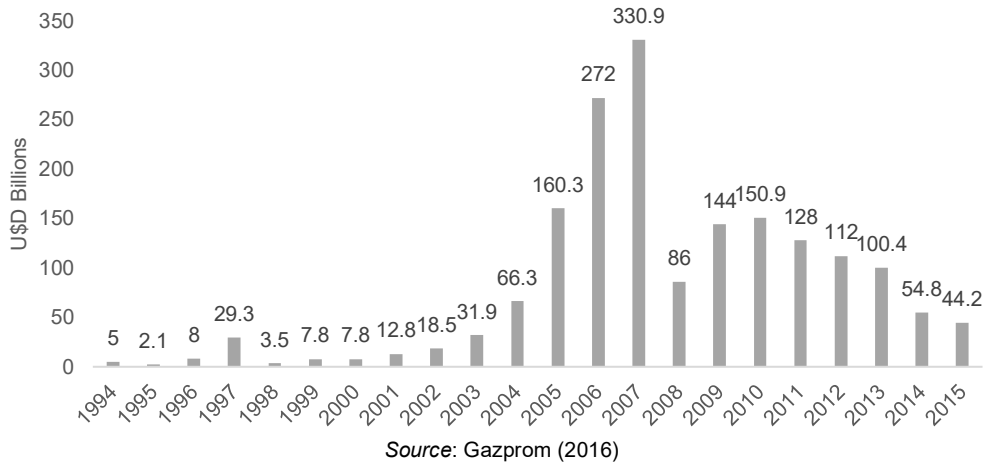
[12] The estimate does not take into account the unconventional gas reserves. Currently, no detailed-accurate picture on the unconventional gas reserves can be drawn.
[13] At the end of 2008 Gazprom's market capitalization was U$D 306.79 billion (Gazprom, 2008).
[14] Russian gas exports covered about 58 % of European gas demand (EIA International Energy Statistics Database).

A combination of the 2008 global financial crisis, Russia's energy disputes with Ukraine, shifts in EU policy and changes in the international gas market have triggered developments that are changing the dynamic of energy relations in Europe. Moreover, the EU attempts aiming at the creation of a single liberalized European energy market (3rd EU Energy Package), the European Commission's competition inquiry into Gazprom, the emerging shale gas revolution and the growth of LNG mean that a combination of widening supply options now pose a serious challenge to Russia's energy dominance. European governments are actively developing alternatives to Russian gas supplies and prices. The volumes of Russian exports to Europe have declined by 5 % since 2008 (see Table 4), and Gazprom has suffered a-seven-fold- reduction of its market value in relation to the equivalent of 2007 (see Figure 8).

Table 4: Gazprom's gas sales to Europe-including Turkey (2008-2016).

Year	Price (U$D /$m^3$)	Volume (m^3)	Revenues (U$D/b)
2008	256	167.6	68.8
2009	238.6	152.8	38.4
2010	302	138.6	41.9
2011	383	150	57.5
2012	402	138.8	55.8
2013	385	161.5	62.2
2014	349	146.6	51.2
2015	238	160	38
2016	200	160	32

Sources: data for years 2008 and 2009 retrieved from "Gazprom in figures 2008-2012" and data for years 2010-2016 retrieved from Mazneva (2015). Abbreviations: U$D/$m^3$= United States Dollars/ cubic meter; m^3=cubic meter; U$D/b= United States Dollars/ barrel



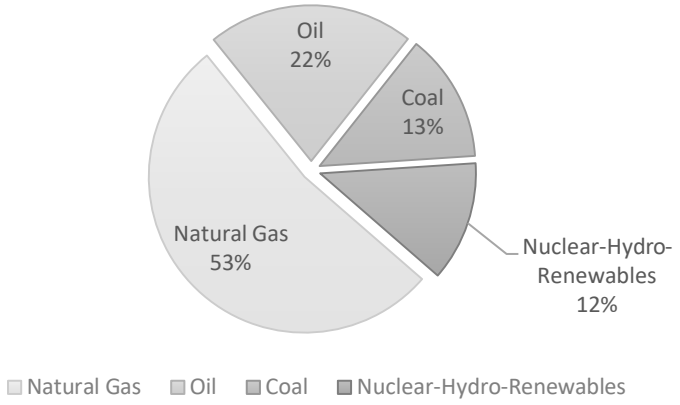
Source: Gazprom (2016)

Figure 8: Gazprom's capitalization.

Since 2015, Russia has dropped in second place (16.1 %) in total world production of dry gas as it was overtaken by USA (22 %) due to the US Shale gas boom, is the world largest producer of crude oil- including lease condensate - and the third (12.4 %) largest

producer in petroleum and other liquids after Saudi Arabia and USA (both 13 %) and is still in 6th (4.8 %) place of world coal producers (BP, 2016).

Energy Primary Consumption: Russia consumed during 2015, 523.8 mtoe (gas, coal, nuclear energy, hydro-electricity and RES) and 143 mto (BP, 2016 - see Figure 9).



Source: BP statistical review of world energy (2016)

Figure 9: Russia's primary energy consumption by fuel: 2015.

Energy export potential: Russia's current export potential of various energy forms is significant. According to BP (2016), Russia is presently able to export over 181.8 bcm of gas, some 397.7 mto, and over 95.8 mtoe of coal.

3.1.1. Russia's oil sector

Sector's Organization: Following the collapse of the Soviet regime, Russia initially privatized its oil industry, but since Putin era, the oil and gas sector have gradually reverted to state's control to support both domestic and foreign policies-goals of Putin regime. Five firms, namely Rozneft, Lukoil, Surgutneftegaz, Gazprom and Trasneft, including their shares of joint venture production, contribute in more than 75 % of Russian total oil production, while the Russian state directly controls more than 50 % of total oil production (EIA, 2016).

Oil exports: In 2015, most Russian crude oil exports (62 %) and oil products (52 %) were delivered to European countries. (Table 5 and 6) Additionally, revenues from crude oil and products exports in 2015 accounted for 46 % of Russia's total export revenues (UN Comtrade Database, 2015). While Russia is dependent on European consumption, EU is similarly dependent on Russian oil supply, with almost 30 % of EU crude oil imports in 2015 coming from Russia (European Commission, 2016a).

Table 5: Russia's crude oil exports by destination, 2015.

Region	Crude Oil/mt	% of total Russian crude oil
China Republic	42.41	16.6
Europe	158.5	62
Japan	14.2	5.6
Other Asia/Pacific	11.2	4,4
Other CIS	23.2	9
USA, South &Central Amerika	2.3	0.8

Source: BP statistical review of world energy (2016). *Abbreviation*: mt=million tons

Table 6: Russia's oil product exports by destination, 2015.

Region	Oil Products/mt	% of total Russian oil product
Africa	0.9	0.6
China Republic	3.8	2.5
Europe	88.9	52.2
Japan	1.9	1.3
Other Asia/Pacific	8.7	5.8
Other CIS	23.2	15.4
North America	15.8	10.5
South & Central Amerika	1	0.7

Source: BP statistical review of world energy (2016). *Abbreviation*: mt=million tons

Pipeline network: Russia has an extensive domestic distribution and export pipeline network, which is nearly completed owned and run by the state-owned Transneft (for more details see Table A1 in the Appendix).

3.1.2. Russia's gas sector

Sector's organization: The state-run Gazprom dominates Russia's upstream gas sector, owning the world largest gas transmission system with a total length of 106.378 thousand miles (Gazprom, 2016). The company's share in global and Russian gas proved reserves amount, to 17 and 72 % respectively (Gazprom, 2016). Russia has also numerous independent producers who now control 38 % of gas resources, but at this stage account for only 16% of production (Romanova, 2016).

Gas exports: In 2015, almost 159.8 bcm of Russia's gas exports were delivered in Europe via pipelines. Germany, Italy, Turkey and Belarus absorbed the largest volume (70 %) of those exports (see Table 7). At this point, it should be noted that the Ukrainian imports of Russian gas declined in 2015 by 28 % (7 bcm) in relation to 2013 (25.1 bcm) due to both often gas price-payments disputes between Ukraine and Russia and Russia's military and political involvement in 2014 Crimean Crisis, which affected their diplomatic relations. The above strained relations resulted in a remarkable decline of Ukrainian dependency on Russian gas from 93 % of total Ukrainian gas imports in 2013 (BP, 2014) to 43 % in 2015 (BP, 2016). In 2015, revenues from gas imports accounted

for about 13 % of total Russian export revenues, showing that Russia is significantly dependent on the European energy market. Additionally, European countries is also dependent on Russian gas supply in varying degrees (see Table 7). Some of them, namely Belarus, Finland and Hungary, Baltics and most of Southeast European Countries cover almost all of their gas needs from Russian imports, being vulnerable to the Russia's political-economic leverage. On the other hand, Russia exported in 2015, 14.5 bcm in the form of LNG to Asia. More than 70 % of the above volumes were absorbed by Japan (see Table 8). Since mid-2000s, Russia has started to draw up a new energy strategy ("Putin's strategic shift eastwards") for expansion of gas exports in the form of LNG, focusing on intensive Asian market to diversify its gas export portfolio. The western sanctions, implemented in 2014 to Russia, in response to the military and political intervention of the latter in the internal affairs of Ukraine (Crimean Crisis), led Russia via Gazprom in May 2014 to sign with the China National Petroleum Corporation (CNPC) a 30-year deal to deliver 38 bcm to China annually via the eastern route ("Power of Siberia" project) and 30 bcm via western route ("Power of Siberia–2"). However, it is now generally accepted that the announced volumes will be lower (Reuters, 2016a).

Table 7: Russia's gas exports via pipeline by destination, 2015.

Country	Gas volumes / bcm	% of total Russian gas exports	% dependency on Russian gas
Austria	4.3	2.7	71.6
Belarus	16.8	10.5	100
Belgium	10.9	6.8	46
Czech Republic	4.1	2.5	53.2
Finland	2.7	1.7	100
France	9.5	6	26.4
Germany	45.2	28.2	43.4
Greece	1.9	1.2	76
Hungary	5.8	3.6	100
Italy	24	15	47.8
Kazakhstan	5.0	3.1	63.3
Netherlands	2.3	1.4	7.6
Poland	8.8	5.5	79.2
Other CIS	4.4	2.8	86.3
Other Europe	9.8	6.1	48
Slovakia	3.7	2.3	28.6
Turkey	26.6	16.6	67
Ukraine	7	4.4	43.2

Source: BP statistical review of world energy (2016), *Abbreviation*: bcm=billion cubic metres

Table 8: Russia's LNG exports by destination, 2015.

Country	Gas volumes / bcm	% of total Russian LNG exports
China Republic	0.2	1,4
Japan	10.5	72.4
South Korea	3.5	24.1
Taiwan	0.3	2

Source*: BP statistical review of world energy (2016)* Abbreviation*: bcm=billion cubic metres*

Pipeline network: Russia's gas transmission network includes round 100.000 miles of high-pressure pipelines and 22 underground gas storages (UGS) facilities, run-operated by Gazprom (Gazprom, 2016). Since the late 2000s, Gazprom has been constructing-planning major new pipelines to accommodate new sources of supply, including fields in Yamal and Eastern Siberia, and new export routes, including exports to China ("Power of Siberia") and new pipelines to northern Europe bypassing Ukraine, such as "Nord Stream" I and II (for more details see Table A2 in the Appendix).

LNG projects: Russia has a single operating LNG export facility, namely "Sakhalin LNG". The majority of the "Sakhalin's LNG" volumes has been contracted to Japanese and South Korean buyers under long-term supply contracts (see Table 8). There are number of proposals in various stages of planning for new LNG terminals in Russia since 2013 (see Table 9). By this year, Russia modified its Law on Gas Exports, breaking Gazprom's monopoly on all gas exports (EIA, 2016).

Table 9: Russia's LNG projects.

Facility (Liquefaction Projects)	Status	Capacity (mt/ year)	Announced start year	Area
Sakhalin	Operating	10+	2009	Pacific coast
Sakhalin (expansion)	Planning	5	post 2020	Pacific coast
Yamal	Under Constr.	16.5	2017	Artic coast
Artic	Planning	16.5+	by 2025	Artic coast
Baltic	Planning	10	post 2021	Baltic coast
Far East	Planning	5	post 2020	Pacific coast
Vladivostok	Planning	15	post 2018	Pacific coast
Pechora	Delayed	8+	?	Artic coast
Shtokman	Delayed	30	?	Artic coast
Regasification Project				
Kaliningrad	Planning	2.4	post 2017	Baltic coast

Source: US Energy Information Administration (2016). *Abbreviation*: mt=million tons

3.2. Kremlin's "Pipeline Politics" against the ex-Soviet countries' sovereignty

Once assumed the presidency, Putin made clear his intention to exploit Russian energy export power as a weapon to regain Soviet Union's Cold War influence around the world, and particularly in Central, Eastern Europe and the Caucuses. Leonard and Popescu (2007) describe Russian foreign policy arsenal by dividing the actions into hard power and soft power categories. They categorize oil and gas embargoes, energy infrastructures takeovers and different energy pricing as hard power actions (see Table 10).

Table 10: Russia's foreign policy arsenal.

Hard Power	Soft Power
Blockades of trading goods	Russian mass-media (propaganda)
Oil & gas embargoes	Financing NGOs
Transports & communications blockades	Economic growth
Different energy prices	Visa free regime
Infrastructures takeovers	Military training
Secessionist conflicts	Authoritarian capitalism
Non-withdrawal of troops	Support-Protection of authoritarian regimes
Arms at discount prices for allies	Exporting 'sovereign democracy'

Source: Liuhto (2010) based on Leonard and Popescu (2007)

Robert Larsson (2006) also stresses: "*Utilising energy policy as a political or economic lever can be accomplished in several ways. A few energy tools of special importance were identified during the research process, namely: a) supply interruptions (total or partial) threats of supply interruptions (covertly or explicit), b) pricing policy (prices as carrots or sticks) c) usage of existing energy debts, d) creating new energy debts, e) hostile take-overs of companies and infrastructures".*

There are many political analysts as well as internal and external political opponents of Putin's presidency who assert that Russia is using coercively its energy sources as political-economic leverage in Europe to foment new democracies that used to be part of the former Soviet Union. Kremlin behaves in former Soviet states, as buffer states, often interfering directly or indirectly in their internal political affairs (from 2004 Ukrainian presidential election led to "Orange Revolution"[15] to 2013 Ukrainian crisis[16] led to the annexation of Crimea by Russia on 18 March 2014)[17]. It is common practice for the

[15] In the aftermath of the 2004 Ukrainian presidential election between leading candidates pro-Western Viktor Yushchenko and pro-Russian Viktor Yanukovych, there was a widespread public perception based on reports of both domestic and foreign election monitors that the results of the run-off vote were rigged by the authorities in favor of the latter. The above perception led to series of acts of civil disobedience organized by Yushchenko's political movement, known as "Orange revolution" due to the color of his political campaign. "Orange revolution" succeeded when the results of the original run-off were annulled and a revote was ordered by Ukraine's Supreme Court. The results of second run-off showed a clear victory for Yushchenko, who received about 52 % of the vote (Copsey, 2005). It should be noted that during his election campaign, Yushschenko suffered an assassination attempt, being poisoned by TCCD dioxin. It is rumored that behind this gruesome attempt was FSB (Van Voren, 2015). Poisoning political enemies in Eastern Europe and particularly in imperial Russia was considered as common practice, which it seems that is adopted till nowadays (Gedmin, 2015).

[16]. Ukraine was suffered unrest, when pro-Russian President Viktor Yanukovych refused to sign an association agreement with the EU. A political movement known as "Euromaidan" demanded closer ties with the EU and the resignation of Yanukovych. This move was ultimately successful, leading to the revolution of February 2014, which deposed the Yanukovych's government. Following his ousting, riots unfolded in Russophone eastern and southern regions of Ukraine, where it drew most of its support (Morelli, 2017).

[17] The Kremlin depict the annexation of Crimea as an act of defending ethnic Russians, and the current conflict in Eastern Ukraine -as a Ukrainian civil war. Russian expansionism has always been veiled by the rhetoric of concern about "Russian compatriots" in neighboring countries (Ambrosio, 2016).

Kremlin, its attempt to manipulate election results in former Soviet states, bringing to power a pro-Russian government that is willing to serve the Russian political agenda-interests to ensure the preservation of those states under Russian sphere of influence. The "colour revolutions" in Georgia ("Rose Revolution")[18] and Ukraine ("Orange Revolution") that brought to power pro-Western governments in 2003-2004 was a sign that these countries were willing to leave the Russian sphere of influence choosing liberal democracy over economic mismanagement, electoral fraud, political corruption and poverty. Putin perceived these revolutions as a direct threat to his rule. A potential successfully modernization-democratization of post-Soviet countries such as Georgia and Ukraine would dramatically undermine his authoritarian regime. Hence, Putin's "secret" agenda seeks to foment pro-Western governments in the neighbouring countries, by either using coercively energy resources or exploiting ethnic divisions (see Table 11) by supporting military and diplomatic separatist movements within them (Crimea and South Ossetia).The most important thing for him is to prevent former Soviet countries from joining NATO,[19] which has nothing to do with national security of Russia - as the Kremlin officially supports -, but to the fear of the latter that may not be able to pursue its expansionist agenda. To understand better how Putin (not known for his tact) respects the sovereignty of the neighbouring former Soviet states, we should focus on a statement of him on Ukraine made at the Bucharest NATO meeting in 2008. Putin speaking to US President George Bush Junior, said: *"You don't understand, George that Ukraine is not even a state. What is Ukraine? Part of its territories is Eastern Europe, but the greater part is a gift from us"* (Times, 2009).

[18] The "Rose Revolution" resulted in a pro-Western change of power in Georgia in 2003. Following this, Georgia pursued a pro-Western foreign policy, declaring European and NATO integration as its main priority. This historical change contributed to Georgia's tensions with Russia, which continue to this day (Welt, 2005).

[19] Georgia's public opinion and ruling government favor NATO membership, but it seems unlikely for Georgia joining NATO due to worries about Russian retaliation (Kavadze, 2014). Regarding Ukraine, due to the above worries, after the 2010 electoral victory of pro-Russian Viktor Yanukovych, the government officially declared neutrality and no longer seeks NATO membership, as it did after the "Orange Revolution" and the presidency of pro-Western Viktor Yushchenko (Besemeres, 2016).

Table 11: Russia's potential leverage in the ex-USSR.

Country	Population (million)	Share of ethnically-Russians (%)	Ethnically-Russians	Ranking of ethnic groups
Armenia	3.0	0.5	15.256	3rd
Azerbaijan	9.8	1.3	127.400	3rd
Belarus	9.5	8.3	788.500	2nd
Estonia	1.2	24.8	297.600	2nd
Georgia	4.9	1.5	73.500	4th
Kazakhstan	18.3	23.7	4.337.100	2nd
Kyrgyzstan	5.7	12.5	712.500	3rd
Latvia	1.9	26.2	497.800	2nd
Lithuania	2.8	5.8	162.400	3rd
Moldova	3.5	5.9	206.500	3rd
Tajikistan	8.3	1.1	91.300	3rd
Turkmenistan	5.3	4	212.000	3rd
Ukraine	44.2	17.3	7.646.600	2nd
Uzbekistan	29.4	5.5	1.617.000	2nd

Source: CIA World Factbook (2016)

For many newly integrated EU Member States such as Poland, Latvia, Lithuania, and for new democracies, like Ukraine, Georgia, and Moldova, Russian energy control is considered as an old but still relevant "nightmare" both for the viability of their economy and thus for the stability-sovereignty of their state. According to Hedenskog and Larsson (2007), some 70 % of Russia's coercive energy actions against the ex-Soviet states were energy supply interruptions (total or partial) during 1991-2006. Over 40 % of those actions were targeted against the Baltic States. Another 40 % of the coercive measures were targeted against Georgia and Belarus (Liuhto, 2010).

Russia's coercive use of "Pipeline politics" began in early 1990s, when Russia cut-off energy supplies to the Baltic States to suppress vainly their independence movement (Smith, 2008). The energy weapon was used against the Baltic States again in 1992, in retaliation for Baltic States' demands, according to which Russia had to remove its remaining military forces from the region. Additionally, in 1993 and 1994, Russia reduced gas supplies to Ukraine, in part, to force Kiev to pay its gas debt (economic dimension), but also to press Ukraine into ceding more control to Russia over the Black Sea Fleet (geopolitical dimension) (Smith, 2008). Moreover, from 1998 to 2000, in an attempt to stop the privatization[20] of Lithuania's "Mazeikiai" refinery (the only oil refinery in Baltic States) through a direct sale by the US firm "Williams International, Inc." ("Williams"), "Transneft", Russia's monopoly transporter of piped oil, stopped the flow of crude oil to Lithuania nine times (Smith, 2008). Later, "Williams" ran into financial trouble, and their stake in "Mazeikiai" refinery was bought by the Russian company, "Yukos". However, in 2003, "Yukos" facing bankruptcy, began to sell off its assets, including "Mazeikiai" refinery. Several potential buyers from Russia, Kazakhstan and Poland showed interest

[20] The privatization was not an open tender because Lithuanian politicians feared that Russian oil companies might gain a stake in the company. The negotiation terms were kept secret and therefore contributed to the popular resistance by Lithuanian citizens and the press to privatization by "Williams" (Sabaliauskaite, 2000).

in acquiring the refinery. After several months of talks, the proposal from Polish company "PKN Orlen" was chosen. Additionally, it was deemed most desirable by Lithuania, which has been aiming to avoid the refinery being bought out by Russian interests (Cienski, 2006). To force Lithuania to reconsider the sale to of "Yukos", Russia, citing environmental risk of leak, shut down the only onshore pipeline supplying Lithuania with crude oil. This action was described as "*tools for intimidation and blackmail*" by the US vice-president, Dick Cheney (Kramer, 2006). The coercive use of pipelines on behalf of Russia against the Baltic States has not received attention in the West -even though Lithuania is a EU and NATO Member State- till Gazprom's supply disruptions of gas and oil to Central Europe in 2006-2007 which forced US and EU to raise awareness, while both have too long ignored the Russian's non-transparent and monopolistic energy policies (Smith, 2008).The reliability of Russian gas was again questioned in 2009 due to a pricing dispute between Russia and Ukraine which caused flow disruptions, leading concomitantly to freezing conditions in Slovakia and Bulgaria in early January 2009.This was attributed to an attempt by Russia to interfere in the internal politics of Ukraine (Kovacevic, 2009).

At this point, it should be noted that some Russian economists, such as former Kremlin economic adviser, Andrei Illarionov,[21] and former deputy energy minister, Vladimir Milov,[22] have openly criticized their country's use of energy supplies as a geopolitical weapon to compete with other powerful geopolitical actors such as the USA and China. They argue that it will distort Russia's own energy system and benefit those in power (Putin and Russian oligarchs), rather than Russia and its people's prospect at large.

On the other hand, there are some analysts, such as Dr. Trenin (2008) and Professor Goldthau (2008) who neither believe in Russia becoming an energy superpower nor consider that the latter is using its energy power as a geopolitical weapon. Both assert that Russian energy strategy is more about increasing state profits by strengthening

[21]Illarianov openly criticized the fact that the gas price was used as a political weapon against Ukraine. He claimed Putin had asked him help spin the price hike, but that he resigned because this move "*had no relation not only with liberal economic policy, but to economic policy at all".* He complained to Ekho Moskvy Radio on 31th December 2005 that "*Energy weapons are used against neighbors*" (Blagov, 2006).

[22]In 2006, Milov stated as follows: *"The energy superpower concept is an illusion with no basis in reality. Perhaps most dangerously, it doesn't recognize the mutual dependence between Russia and energy consumers. Because of political conflicts and declining production, future supply disruptions to Europe are likely. There will come a day when European gas companies demand elimination of the take-or-pay conditions in their Russian contracts. This will threaten Gazprom's ability to borrow. Putin's attempt to use energy to increase Russian influence could backfire in the long run"* (Liuhto, 2010).

Russian state-controlled companies' position in the international energy markets than serving the establishment of geopolitical domination. To be more specific Trenin stresses that: "*energy is a political business, but it is business first and last", while Goldthau argues that: "the rationale behind Russia's recent 'gas disputes' with its neighbours is to a large extent profit maximization, rather than punishing renegade governments in the neighbouring Commonwealth of Independent States(CIS)"*[23] (Liuhto, 2010).

3.3. Kremlin's answer to geo-political challenges threatening its energy domination

Putin is aware of the challenges facing the Russian energy industry. To be more specific, the 2014 sanctions - affecting external finance and access to oil technologies - along with the low oil price and the slowdown both in the global and Russian economy, have "cornered" Kremlin. Moreover, due to the LNG sector's growth and concomitantly the development of new LNG import facilities, countries such as Lithuania and Poland, have the ability to import gas from suppliers around the globe (i.e. US, Norwegian or Qatari LNG) bypassing Russia's traditional lever.[24] Additionally, a set of EU energy diversification and liberalization efforts (i.e. "3rd EU Energy Package") have contributed in giving EU Member States the political and legal tools to mitigate Russia's dominance in their respective gas supply, challenging its monopolistic business practices. On the other hand, Russia's attempts in the past decade to diversify its economy's structure by reducing its dependence on energy exports revenues have not been particularly successful, keeping country's fate tied to the linkage between oil prices and its energy export revenues. A key element of Russia's future strategy is to reduce economic dependence on energy from 30 % now to 18 % of GDP by 2030 (Energy Ministry of the Russian Federation, 2010). Russia's national strategy has till recently two goals: exploiting its energy resources as (i) a foreign policy tool and (ii) a "milking cow"

[23]The CIS is a regional organization formed during the dissolution of the Soviet Union, promoting coordinating powers between participating Member States regarding the trade, finance and security and cross-border crime prevention. At present the CIS consists of: Azerbaijan, Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Uzbekistan, Turkmenistan and Ukraine (the last two are Associate states). Georgia withdrew as a result of Russian-Georgian war in 2008, while the Baltic States refused to participate.

[24]Lithuania and Poland have recently shown considerable progress in mitigating their dependency on Russian gas, opening on December 3, 2014, a floating regasification and storage unit (FRSU) at the port of Klaipėda and on October 12, 2015, an LNG terminal at Swinoujscie respectively. Both LNG facilities along with planned necessary interconnections (such as Gas Interconnection project between Poland and Lithuania and the Balticonnector project between Finland and Estonia) enable Lithuania, Poland and their neighbors to access alternatives to Russian gas and to successfully address their chronic energy vulnerability. They would not only prevent Russia from threatening potential gas disruptions of supply, but also deprive Kremlin's opportunity to raise gas prices as a means of exerting political leverage (Roberts, 2016).

(Goodrich and Lanthermann, 2013). But the use of energy in serving geopolitical plans contrast its market goals. Global and regional circumstances have changed to the point that Kremlin has now to focus on defending its market share – establishing stable relations with traditional (Germany, Italy, Turkey) and new consumers (China, Japan, South Korea), to support its fragile economy, removing even temporarily energy weapon from its foreign policy arsenal. The 2030 target is to maintain a 10 % share of global oil trade and 20% of natural gas (Energy Ministry of the Russian Federation, 2010).The Kremlin has begun crafting a set of policies designed to adjust the country to the changes that will come in the next decades. It seems that Russia has understood that the new structure of the EU market (single, transparent - open market) is a competitive marketplace with increasing supply and interfuel competition. To succeed there, a supplier must adapt to the new reality. The time that EU wanted a strategic-political energy relationship with Russia has gone. EU has made now clear its intention to convert this relationship into an exclusive commercial one to the disappointment of the Kremlin's energy agenda. On the other hand, as we will see below, examining the controversial Nord Stream II pipeline project, the traditionally good trading relationship between Germany and Russia is acting as "Trojan horse" against the EU Energy Union aims, showing that the Member States are not unified in a common energy policy, seeking to serve their national strategic interests. The unified Russian-German stance has been consistent throughout the controversy, defending this pipeline route as a "*commercial project*" which additional capacities "*would result in a more enhanced EU energy security*" (Adomeit, 2016).

Russia is now addressing the very damaging uncertainty surrounding its relationship with key transit states such as Belarus and Ukraine. The construction of the Ust-Luga oil terminal on the Baltic Sea allows Russia to largely bypass the Belarusian pipeline system and ship crude and oil products directly to its big consumers. Similarly, the construction of the Nord Stream I gas pipeline under the Baltic Sea allows Russian gas to bypass both the Ukrainian and Belarusian transit systems. According to James Henderson and Tatiana Mitrova (2015) transit fees across Ukraine make that route "significantly more expensive" than Nord Stream I. However, Ukrainian transit remains essential for the Kremlin, at least until 2019 (estimated date of completion of Nord Stream II), when the current transit contract will expire (Buckley, 2016). By allowing Russia to guarantee deliveries to its major European customers, the bypass systems ensure Moscow's vital energy revenues (Goodrich and Lanthermann, 2013). Additionally, Gazprom's plans to build Nord Stream II controversial pipeline project have caused serious concerns. Legally, there are doubts as to whether the project is fully compliant with EU regulations.

Although the Nord Stream II consortium consists of multiple international companies, there should be no illusions about the producer and the transporter of the gas running this route, namely Gazprom. Due to concerns regarding competition and energy security, the European Commission considers this an unwisely high concentration of supply from a single supplier along one transit route (De Jong, 2016). Moreover, the Members of the European Parliament (2016) stressed in a debate (Plenary session from 09.05.2016 to 12.05.2016) with Climate Action and Energy Commissioner Miguel Arias Canete that this project would harm Energy Union's core aim to promote diversification away from Russia, through investments in LNG terminals, interconnectors and reverse flow capacity. Moreover, calling Nord Stream II a "*test of the European Energy Union,*" the heads of governments of Baltic and central European countries signed and send a letter to the president of the European Commission, Jean-Claude Juncker, according to which they argued that Nord Stream II would weaken security of supply in central and southern Europe (Beckman, 2016). They fear that it would isolate their countries from liquid Western European gas markets and makes them more vulnerable to Russian price discrimination (Vorloeper, 2016). They also argued that the continued use of their gas transit systems by Russian gas would be in the interests both of their economies and of market competition (Jegelevicius, 2016). According to Agnia Grigas, PhD Non-resident Senior Fellow at the Atlantic Council, this project should not be perceived as a commercial and economically viable project (as Kremlin supports) but it serves geopolitical goals, taking into account the low gas prices, the demand in Europe (in 2015 was approximately 20 percent lower than in 2005 - De Jong, 2016), the overcapacity in the global gas market and finally the continuing underuse of European gas import infrastructure (Nord Stream I has not been used at its full capacity) (Jegelevicius, 2016). On the other hand, the traditionally good strategic-commercial relationship between Russia and Germany is threatening gas market competition - undermining the objectives - spirit of the EU Energy Union as well as the finances of the gas transport businesses of countries (Ukraine, Poland, Belarus) between the two states (Powell, 2016).

Russia has adjusted its energy strategy with European customers amid growing energy diversification and liberalization efforts. The Kremlin knows that its only hope of protecting gas revenues in the face of a potential global shale boom is to lock its customers into price-competitive, long-term contracts. (The American Interest, 2016). To keep its export volumes in a period of low demand and increasing competition, Kremlin has also to show more flexibility in its supply contracts by increasing the percentage of spot pricing (Zvonareva, 2015), providing a significant lower price benefit for end-consumers comparing to oil-indexation pricing contracts.

Russia has decided to invest significant funds for the development of interconnections with growing energy markets of East Asia, seeking to diversify its portfolio of exports, expecting that the challenges in the European energy market will continue intensifying (Romanova, 2016). The development of eastern Siberia and the Far East are linked to the reorientation to Asia, aiming to provide a counterbalance to Europe and to western sanctions. But this is not without challenges. Kremlin is facing a tighter financial situation, due to price dynamics, western sanctions, and thus there are difficulties of financing new large-scale energy projects. Moreover, Asian energy demand is strongly affected by China's undergoing economic slow-down (Romanova, 2016).

Finally, according to the research team of Energy Institute of the Higher School of Economics & the Energy Research Institute of Russian Academy of Sciences (Zvonareva, 2015), the low European gas demand can lead to price competition between Russian gas and American LNG. Furthermore, in the case of low Asian demand, Middle Eastern gas will also flow to the EU and the price competition for Russia would be tougher. The analysts conclude that the price dumping would not help to Russia to "knock out" its competitors as it would cause a substantial loss of revenue.

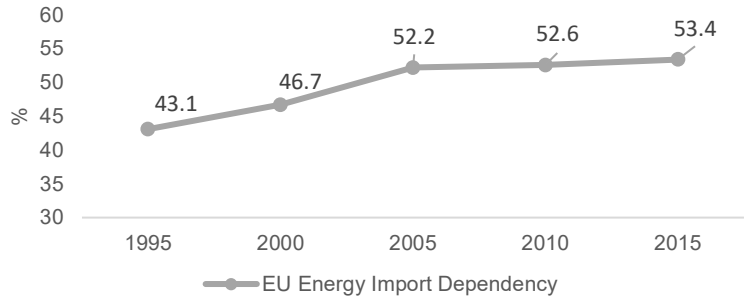
Although, the Kremlin's energy strategy has managed to adjust Russia to the current and potential geopolitical challenges, addressing proactively the external shifts in energy consumption and production trends, but Russia's dependence on high oil prices causes legitimate questions about the long-term sustainability of the energy model of Russia.

4. Increasing reliance on imported hydrocarbons a threat for the EU energy security

In the following section, there is a briefly analysis of the EU's energy import dependency on third countries such as Russia, focusing on its high oil and gas import needs, which makes the EU vulnerable in case of potential supply disruptions and price volatility. The EU's energy import dependency gained an added dimension in the light of recent geopolitical events, i.e. the Ukrainian crisis. Temporary disruptions of gas supplies in the winters of 2006 and 2009 already provided a wake-up call for the EU, underlining the need of infrastructure development, increased cooperation-solidarity and of a unified European energy policy. Since then, the EU has done a lot to strengthen its energy security. However, the diversification progress is not as much as EU would prefer and thus further steps are needed.

4.1. EU energy import dependency

The energy import dependency of EU stood in 2015 at 53.4 % (see Figure 10). In 2015, the top-6 least dependent Member States were Estonia (8.9 %), Denmark (12.8 %) and Romania (17.0 %), followed by Poland (28.6 %), the Czech Republic (30.4 %), Sweden (32.0 %). On the other hand, the top-6 highest dependent states were Malta (97.7%), Luxembourg (96.6 %), Cyprus (93.4 %), Ireland (85.3 %), Belgium (80.1 %) and Lithuania (77.9 %) (Eurostat, 2016).

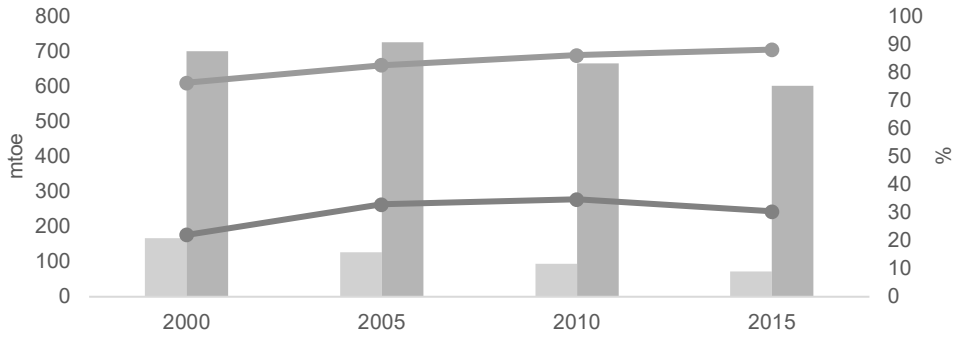


Source: Eurostat (2016)

Figure 10: Evolution of the EU energy import dependency: 1995-2015.

4.1.1. EU oil import dependency

EU is the world's largest oil-importing region and the second largest (13.9 % of world total consumption) -after the US- oil consuming market in the world (BP, 2016). Moreover, according to "Eurostat Energy Balances", contrary to what many believe, the rate of EU dependence on oil imports (88 %) is much higher compared to its dependence on gas imports (70 %). Since 2000, the domestic oil demand has fallen (nearly 5 %) but crude oil extraction in the EU has fallen at a faster rate (nearly 58 %). The UK[25] and Norway are Europe's two significant oil producers, extracting oil from the North Sea, but their production is progressively declining. To be more specific, UK output fell from 2.6 million barrel per day (mbd) to 0.9 mbd between 2000 and 2015 (nearly 34.6 %) while in Norway it fell from 3.3 mbd to 1.9 mbd during that period (nearly 57.5 %). Norway's output is not counted as EU production, but the drop in UK output has led to a fall in the EU's total output from 3.5 mbd to 1.5 mbd (historical low) between 2000 and 2015, representing a drop of nearly 43 % (BP, 2011 and 2016). This has led to an increased EU dependency on oil imports, which accounted for over 88 % of the EU's total oil consumption in 2015, compared to 76 % in 2000, while oil dependency on Russian oil now accounted for 30 %, compared to 22 % in 2000 (see Figure 11). In 2015-a year of low oil prices-, the EU spends some €215 billion (bn) on crude oil and diesel imports, over 5 times as much as gas imports (€40 bn in the same year) (Cambridge Econometrics, 2016).



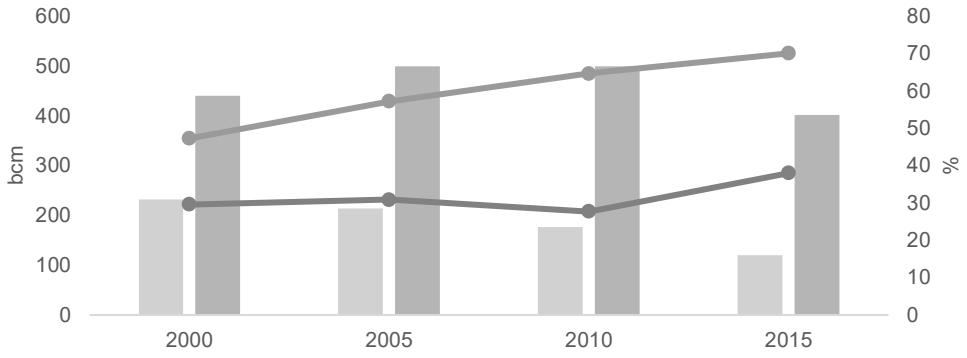
Source: Eurostat Energy Balances

Figure 11: EU oil import dependency.

[25]The result of a British referendum on 23 June 2016 was a majority in favour of the United Kingdom (UK) leaving the EU. Legally, the referendum was advisory rather than binding, and no formal process for leaving has been initiated yet.

4.1.2. EU gas import dependency

Since 2000, the EU gas demand has fallen (nearly 8,7 %)[26] but domestic gas production has fallen at a faster rate (nearly 48 %). The UK and Netherlands are contributing at most in EU gas production, but their domestic production is progressively declining. To be more specific, UK output fell from 108.4 billion cubic meters (bcm) to 39.7 bcm between 2000 and 2015 (nearly 63.3 %) while in Netherlands it fell from 58.1 bcm to 43 bcm during that period (nearly 26 %) The drop in both countries' domestic output has led to a fall in the EU's total output from 231.9 to 120.1 bcm (historical low) between 2000 and 2015, representing a drop of nearly 48 % (BP, 2011 and 2016). This has led to an increased EU dependency on gas imports, which accounted for over 70 % of the EU's total oil consumption in 2015, compared to 47 % in 2000, while gas dependency on Russian gas accounted for 38.4 %, compared to 29.6 % in 2000 (see Figure 12).



Source: Eurostat Energy Balances

Figure 12: EU gas import dependency.

4.1.3. Potential supply risk for the EU being based on geopolitical unstable source-countries

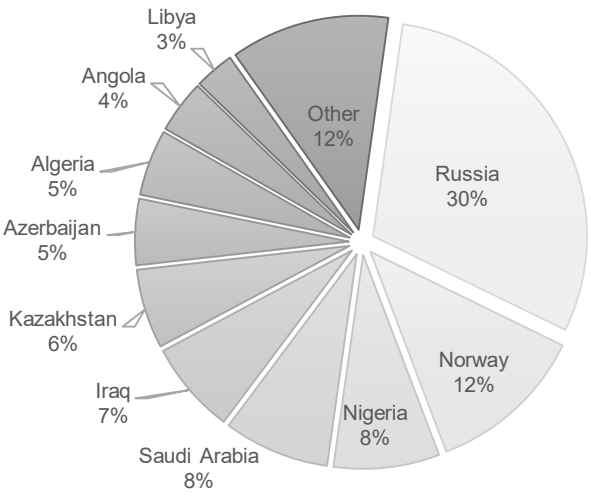
Russia is the biggest crude oil supplier, accounted for 30 % of EU imports in 2015 (see Figure 13). As in the oil sector, Russia is also the biggest gas supplier accounted for 38 % of EU imports in the same year (see Figure 14). As we see below, the EU oil and gas demand-excluding Norway-are covered by regions which can be characterized as geopolitically unstable as they are experiencing either geopolitical tensions and terrorism or internal conflicts-war (see Table 12). As a result of the EU's high reliance on gas and oil imports from such regions, EU energy market-economy are both highly exposed to the effects of potential supply shortages and oil price volatility (Bergamaschi, 2015).

[26] The main factors led to falling demand are interfuel competition and economic instability, (Zvonareva, 2015).

Exposure to security of supply risk for oil and gas imports varies substantially across EU Member States.

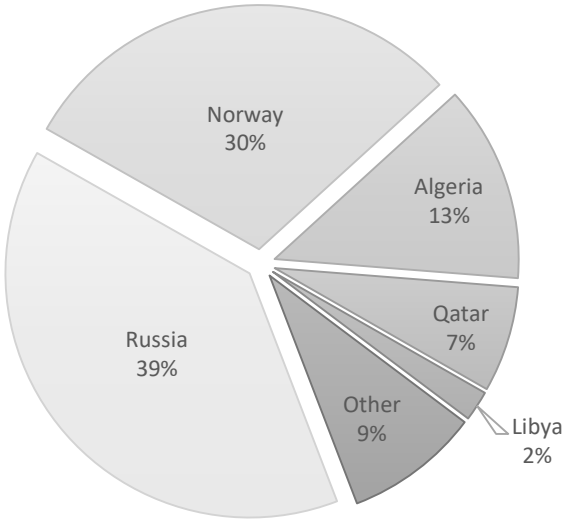
According to above mentioned Cambridge Econometrics' report, the current risk of security of supply for crude oil is the highest for Poland and Hungary, which are reliant on one single supplier (Russia) for over 90 % of their supply of crude oil, while they are also reliant on Russia for 71 % and 100 % of their supply of gas respectively (BP, 2016). Furthermore, the sources of crude oil available to landlocked Eastern European members (such as Slovakia, the Czech Republic and Hungary) cannot be diversified because these countries have no ports for oil tankers and so are completely reliant on Russian oil pipelines (this vulnerable situation stresses the vital need of developing LNG facilities in littoral states of Baltic, Adriatic and Black Sea linked with reverse-flow pipeline interconnections). The Russian annexation of Crimea in 2014 increased geopolitical instability in the East European region and raised concerns about the availability of Russian oil and gas supplies to these EU Member States.

On the other hand, some EU Western Member States, such as Denmark and Netherlands, France can rely both on their domestic energy production, their large ports and their substantial gas storage capacity (see Table 13). These additional supply options provide flexibility to address potential disruption of energy supply from a single supplier-country.



Source: Eurostat Energy Balances

Figure 13: Main sources of EU crude oil imports: 2015.



Source: Eurostat Energy Balances

Figure 14: Main sources of EU gas imports: 2015.

Table 12: EU oil and gas geo-political unstable supplier-countries.

Country	Share % of EU imports…		Quantities-imported…		Geopolitical Status-quo
	…oil	…gas	…oil	…gas	
Russia	30.4	38	160.6	133.2	-Disturbed relations with the EU due to imposed sanctions following the annexation of Crimea
Algeria	5	8.3	26.4	30	-In the "Arab Spring" wake, there is still political instability-polarity and a high risk of terrorist attacks
Angola	4	----	21,1	----	-Serious humanitarian crisis because of prolonged civil war -Depredation of the country's rich mineral resources by authoritarian regime
Azerbaijan	5	0.6	26.4	0.16	-Long-standing dispute over the Armenian-occupied territory of Nagorno-Karabakh is almost certain to spark a new war
Nigeria	8	1.3	42.2	4.7	-The terrorist group Boko Haram controls large territories of the country
Saudi Arabia	8	----	42.2	----	-Neighbouring countries, such as Yemen, face particularly high risk of terrorism and conflict
Iraq	7	----	37	----	-"Islamic State", controls large territories of the country including many of the country's oil fields
Kazakhstan	6	----	31.7	----	-Geopolitical influence upon the region of Central Asia is already a field of conflict of interest between Russia and China. -The "Crimean" case might be repeated
Libya	3	1.8	15.8	6.5	-In the "Arab Spring" wake, violent clashes continue to occur and there is still a high risk of terrorist attacks

Source: Cambridge Econometrics (2016). *Abbreviations:* mt=million tons; bcm=billion cubic metres

Table 13: EU Gas storage capacity.

Country	Number of facilities	Type	Total capacity (mcm)	Total peak output (mcm/day)
Italy	10	-Depleted gas fields	16310	279.8
Latvia	1	-Aquifer	2300	30
Netherlands	8	-Depleted gas field -Salt cavern -LNG	14369	339
Poland	7	-Depleted gas field -Salt cavity	2795	49
Portugal	2	-Salt cavern -LNG	476	23.2
Romania	2	-Depleted gas field	2777	28
Slovakia	1	-Depleted gas field	3156	45.1
Spain	4	-Depleted gas/oil field -Aquifer	2632	16.4
Sweden	1	-Line rock cavern	9	0.9
UK	10	-Depleted gas field -Salt cavern -LNG	4620	174.8

Source: EIA Gas Information (2016). *Abbreviations:* mcm=million cubic metres; mcm/day=million cubic metres per day

4.2. The 2014 Russian-Ukrainian crisis' implications for the EU's energy strategy [27]

The Ukrainian crisis has surely had a strong-negative impact on the EU's energy security. To be more specific, gas supplies from Russia were particularly at risk, as more than 50 % of gas exported from Russia to the EU has to be transported through Ukraine, a country that has been de facto at war with Russia since Russia's military intervention in Crimea. In addition to, the situation on the gas market got even worse due to the lack of agreement both on future supplies of gas between Russia and Ukraine and on the size of Ukraine's gas debt to Russia. The lack of agreement on those issues caused Russia's stopping gas supplies to Ukraine on 15 June 2014. At that time, there was also a real danger-fear that gas supplies to the EU could also be disrupted, as happened in the previous Russian–Ukrainian gas disputes in 2006 and 2009. In particular, there was a fear that six EU Member States that completely depended on Russia for their entire gas imports, namely Finland, Slovakia, Bulgaria, Estonia, Latvia and Lithuania could be affected, with Slovakia[28] and Bulgaria[29] facing the most critical situation as they received

[27] Please note that parts of this section are based on a written assignment ("EU-Russia Interdependence and Security of Energy Supply in Europe") written by author within the framework of course "Energy Transport and Storage" by Professor Dr. Sandro Furlan.

[28] As a result of "Crimean crisis", Slovakia has managed to diversify its supply of gas, reducing its dependency on Russian gas in 2015 at 29 % of its total supply compared to 100 % in 2013-2014 (BP, 2016).

[29] According to Temenujka Petkova, the outgoing energy minister, Bulgaria and its EU partners have absorbed the lesson of the 2009 crisis. As she stated: "*We've worked in a focused way to avert a similar situation by going for diversification of routes and sources of supply. Our actions are within an overall EU energy policy framework. There's no way we'll reach a 2009-type situation again*". To diversify its energy supply, Bulgaria and its EU partners have planned to construct new cross-border pipeline routes. The most important among them is that of the gas "Interconnector Greece-Bulgaria" (ICGB). It will deliver 1 bcm of gas from the "Shah Deniz 2" field

all their Russian gas through Ukraine. In January of 2009; Russia tried to settle a payment dispute with Ukraine, its main transit country, by turning off the gas flow. During the gas disruption, Bulgaria's reserves ran out, Slovakia was forced to declare a state of emergency. For the EU, it was a shock to see how vulnerable new Member States, liberated in 1989 from Soviet political control, were to a Russian gas embargo.

Unboundedly, the Russian-Ukrainian crisis that broke out in February 2014 has lifted the issue of energy security higher on the EU political agenda. The proposal to create an EU Energy Union was first made by the president of the European Council Donald Tusk in April 2014. This, he argued, would prevent "*Russia's energy stranglehold*" on Europe (Siddi, 2016). In response to the Russian annexation of Crimea, the "European Energy Security Strategy" launched in May 2014, which aims to ensure a stable and abundant supply of energy for European citizens and the economy. As part of the Strategy, 38 European countries, including all EU countries, carried out energy security stress tests in 2014. The tests showed that a prolonged supply disruption would have a substantial impact on the EU's security of supply. In particular, Eastern EU countries would be strongly affected. Based on the analysis of the stress tests, a number of short-term measures were adopted in preparation of the 2014-2015 Winter. The Strategy also addresses long-term security of supply challenges. It proposes actions in five key areas: (i) increasing energy efficiency (by at least 27 %) and reaching the proposed 2030 energy and climate goals, (ii) increasing domestic energy production and diversifying sources and routes, reversing energy flows if necessary, (iii) completing the establishment of a fully integrated-liberalized internal energy market and building missing infrastructure interconnectors to rapidly respond to supply disruptions, (iv) adopting a unified EU external energy policy *("negotiate with one voice vis-à-vis"* third countries such as Russia), (v) strengthening emergency response and solidarity mechanisms, (vi) decarbonize the economy (to achieve a target of 40 % emissions reduction by 2040) - become a global leader in clean-green energy technologies.[30] Moreover, In February 2015, the European Commission published the "Energy Union package" which aims to pave the way for the creation of an integrated European energy market, where Member States cooperate to strengthen their energy security, decarbonize their economy by making their energy sectors' more climate-friendly, and decreasing its reliance on external energy suppliers such as Russia (Siddi, 2016). Following, the European

in the Caspian and it will be completed by late 2018 or early 2019. Moreover, domestic oil exploration-production can also add another dimension to the efforts of Bulgaria for energy diversification (Black Sea shelf) (Barber, 2016).

[30] Low carbon transport policy and other policy measures to reduce domestic oil consumption will contribute in achieving these targets.

Commission announced a series of proposals for its gas and electricity markets in 2016 and 2017, among which was the “Sustainable Energy Security Package”, published in February 2016, consists of four proposals. To be more specific, two of them have a legislative nature, namely a Regulation for Security of Gas Supply (Regulation) and a Decision on Intergovernmental Agreements on energy (Decision). Regarding the Regulation, the Commission proposes a shift from national approach to a regional approach when designing security of supply measures, introducing a solidarity principle among Member States to ensure the supply of households and essential social services in case of a potential severe supply crisis. Regarding the Decision, it introduces an ex-ante assessment-binding on Member States - of compatibility of intergovernmental agreements between them and third countries with the EU competition rules and internal energy market legislation. At this point, we should also refer on EU council’s recent meeting’s outcomes regarding the security of supply issues, took place on 5th December of 2016, where the Council agreed that long-term gas contracts providing 40 % or more of annual gas consumption in any member state will be notified to the competent authority (European Council, 2016). This decision (along with Europeans Commission’s antitrust inquiry of Gazprom) will primarily affect eastern European countries, where Russian giant Gazprom remains the dominant supplier. On the other hand, the two non-legislative proposals are strategy papers dealing respectively with LNG and Gas Storage (improve access of all Member States to LNG by investing in the construction of the necessary infrastructure), and Heating and Cooling (focuses on removing barriers to decarbonisation in buildings and industry) (European Commission, 2016).

4.2.1. Diversification of energy transport routes

The EU has planned a number of new gas pipelines as part of the so-called "Southern Energy Corridor” in order to diversify its energy transport routes. These pipelines are supposed to supply the EU with gas from the Middle East, the Caucasus and the Central Asia. A number of transport routes are included in this energy project such as the Trans-Adriatic gas pipeline (TAP), a pipeline connecting Turkey, Greece and Italy (ITGI), a pipeline connecting Azerbaijan, Georgia and Romania (AGRI), the Trans-Caspian gas pipeline and the South-Eastern European Pipeline (SEEP). Currently, the most promising project is the TANAP pipeline (Trans-Anatolia Gas Pipeline). This pipeline would start at the border of Georgia and Turkey and deliver gas to the border of Turkey and Bulgaria.

However, the flagship project of the “Southern Energy Corridor” was the “Nabucco” pipeline, a joint European and American project aimed at undermining Russian influence over the European continent, reducing Russian energy imports by supplying Central Europe from Caspian Sea with 31 bcm of gas annually. It has been aborted (2013) due to a combination of geopolitical factors and business considerations, showing that EU is not unified in terms of a common energy strategy (Weiss, 2013).

The European Union's policy to diversify transport routes would endanger Russia’s position as the largest exporter of oil and gas to the EU. Looking beyond the economic losses regarding Russia’s revenues deriving from the transit of oil and gas to the European market. In the case of a successful implementation of the mentioned EU projects, Russia’s vulnerability would be enhanced due to a partial reduction of its geopolitical influence in vital areas of its interest (Putin’s version of “Lebensraum”)[31] such as former-Soviet states.

4.2.2. Diversification of supplier source-countries

The diversification of the EU’s energy supply and the reduction of its dependence on Russian energy commodities lie in the core of EU energy agenda. To achieve that, EU will require exploiting alternative-third countries’ sources of energy to enhance its security of energy supply. This may include increasing LNG imports from Algeria, Qatar or Nigeria, increasing gas imports from Norway and exploring the possibility to import shale fuels from the USA. In my opinion-based on the above geopolitical analysis-strengthening EU energy security on a long term strategy will not be achieved by being based largely on energy imports from geo-political unstable regions such as Africa and Middle East. On the other hand, regarding the potential benefits from exploiting US LNG as an alternative source of supply, some analysts predict that its arrival in European gas markets could spark a price war, leading to lower prices for consumers that could boost the European economy. Surely, Russian pipeline gas can be cheaper than US LNG,

[31]The concept of “Lebensraum” (“living space”) refers to the German-Reactionary modernism ideology (for more information, see Jeffrey Herf ’s book “*Reactionary Modernism: Technology, Culture, and Politics in Weimar and the Third Reich*”,1984) expressing expansionist ideas from the 1890s to the 1940, according to which Germany "entitled" to conquer the territories of neighbouring countries to secure German people’s prosperity The most extreme form of this ideology was supported by Hitler’s Nazi Party in the Third Reich against neigbouring countries such as Austria, Poland and Czechoslovakia. Pro rata, from my point of view, the annexation of Crimea seems as an provocative attempt of Putin to establish a “Lebensraum” for Russia near its western borders.

because that type of gas has to be liquefied, shipped and regasified at arrival. But many in Europe see the U.S. LNG entry into the market as part of a broader geopolitical effort to challenge Russian domination of energy supplies and prices. *"The new LNG will put downward pressure on prices, and losing both volume and value could be a hard pill to swallow for Russia"*, said Trevor Sikorski of London-based consultancy Energy Aspects (Wall Street Journal, 2016) When Lithuania opened its "FSRU Independence" LNG import terminal at the end of 2014, Gazprom's answer was a gas price discount to Lithuania. "*We have such low production costs that we will always be able to cut the selling price by a dollar or two when it comes to fighting off a rival",* said a senior source at Gazprom (Reuters, 2016b). Although an aggressive policy aiming to maintain its EU market share by discounting its prices would hurt the Gazprom's margins, at the same time it would make unprofitable for US supplies to cross the Atlantic. Russia is ready to protect its market share by discounting its prices and reworking its long-term take-or-pay contracts whose linkages to oil prices have long been points of contention in Europe. Before the appearance of US LNG and the threat posed for Russian economic and geopolitical interest by its arrival in the European gas market, Europe's heavy reliance on Russian gas supplies meant it had to accept its onerous terms. Thanks to a quickly growing global LNG market mainly due to US shale gas boom, it has more leverage at the negotiating table. Undoubtedly, potential volumes of LNG from the United States would benefit the EU energy markets offering a new supplier to EU consumers, by diversifying its sources of supply. For Eastern part of Europe, especially the Baltic region and Poland where the United States enjoys strong and friendly-diplomatic relations, any decision to export US LNG to that region would be welcomed as a potential offset to their dependence on Russian gas (The American Interest, 2015).

4.2.3. Diversification of energy types

Realistically, a total diversification away from gas or oil during this century is not possible. Even if revolutionary new energy technologies are discovered, the infrastructure to deliver those energies to industrial and domestic consumers would have to be built. Moreover, given the assumption that these energy commodities will be readily available for several generations, some valid decisions still can be made now as to how most wisely use the resource in the longer term and how to diversify away from its use.

For Europe, the diversification away from its use should consist broadly of finding alternate means of electric power generation. To diversify its energy used types, EU has decided to become a leader in the diffusion of Renewable Energy Sources (RES). The

EU's binding commitment to reaching 20 % renewables by 2020 as part of its energy mix is a wise decision that will help to not only reduce emissions, but also stimulate alternatives to gas for power production. In this regard, the EU is on the right track to reduce its dependence on external hydrocarbon suppliers, such as Russia. To achieve that, EU' first priority is the creation of a better transmission grid for integrating existing and new types of RES[32] into the electricity network. This would provide an incentive for further investments, increase network security-efficiency and enable consumers to better control[33] their energy use. With oil and gas prices decreasing, this would provide a perfect opportunity for EU Member States to raise taxes on both, and use the extra revenue to support the transition into a greener, more self-sufficient energy system.

To conclude, EU's renewable and biofuel commitments will be extremely useful, not only for saving the environment, but also from the perspective of reducing Russian gas dependency. The EU's solidarity to the commitment is crucial and an area to look to promote is investment within the newer EU counties to insure these targets are met. In particular, investment in alternate electric power production in countries such as Poland, the Czech Republic, Romania, Bulgaria, and the Baltic states is a far wiser choice for EU than investing in additional pipelines to Russia.

5. Recommendations for a long-term EU energy strategy

Undoubtedly, the EU should take specific actions to mitigate its dependency on Russian hydrocarbons in order to enhance its energy security. A multidimensional approach for doing so would include: (i) Diversification of supply based on the domestic exploitation of "taboo sources" such as shale resources and nuclear energy, (ii) Diversification of sources through LNG, investing in the construction of new gas interconnectors linked with new regasification facilities, focusing on the littoral EU Member States located in the Baltic, Adriatic and Black Sea.

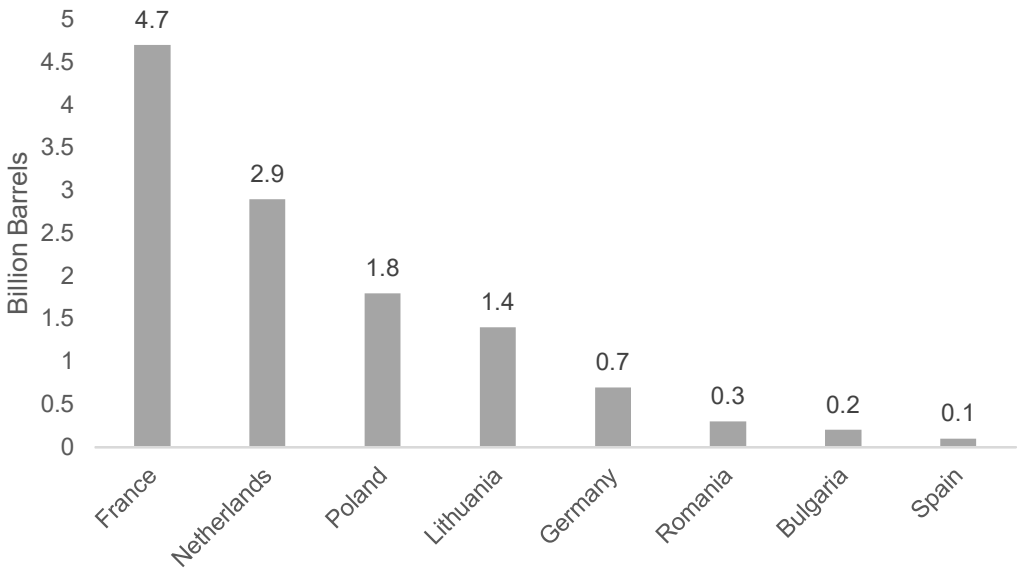
[32] Power-to-gas technology can transform excess electricity from wind or solar sources into synthetic gas, storable or transported in the gas system, helping to address periods when electricity from variable renewable sources is scarce and power prices high (Smedley, 2016).
[33] Denmark's smart grid should be the future for managing electricity consumption. (Danish Energy Association, 2011)

5.1 Domestic production options based on the exploitation of "taboo" sources

To decrease its import dependency, EU must - amid other policy options-increase its domestic energy production. At this point, we should refer that the EU's conventional (oil and gas) proved reserves have been significantly declined round 32,5 % and 64 % respectively since 1995. They are now estimated to be round 5.6 thousand million barrels of oil and 1.3 trillion cubic metres of gas (BP, 2016). Taking into account the above situation, EU must examine the possibility of including - in its long-term energy strategy - the unconventional fossil fuels and nuclear energy, since their exploitation would boost up domestic energy production and hence enhance its energy security in long term. The Conclusions of the European Council on the Energy Union, held on 19 March 2015 emphasize the need to strengthen the security of gas supplies - including exploitation of indigenous resources, which can be read as encompassing shale gas extraction (European Council, 2015).

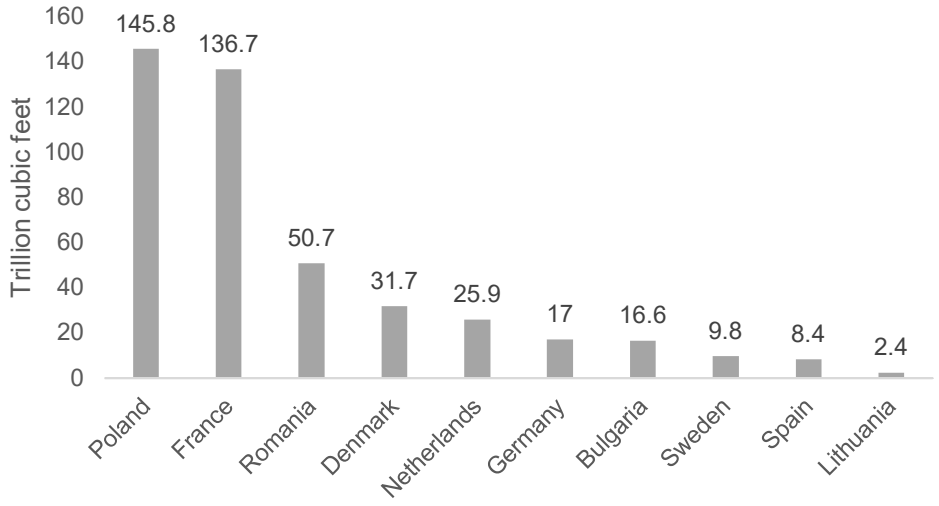
5.1.1 Unconventional fossil fuel (shale) resources

The high petroleum price of recent times has prompted governments around the world to re-examine their energy supplies and to consider national security issues. Whereas at one time an indigenous energy resource such as shale fossil fuels would have been left undeveloped, there are now becoming attractive to more and more countries and feasible to further Research & Development (R&D) programmes. The success story of shale gas boom in North America has urged European countries to examine the productive possibilities of their own rich shales. Unproved technically recoverable EU shale oil reserves are estimated to be round 13.2 billion barrels (bb) (see Figure 15) while EU shale gas reserves are estimated to be round 445 trillion cubic feet (tcf) (see Figure 16).



Sources: US Energy Information Administration (2015) based on world shale resource assessments

Figure 15: EU unproved technically recoverable shale oil reserves by country.



Sources: US Energy Information Administration (2015) based on world shale resource assessments

Figure 16: EU unproved technically recoverable shale gas reserves by country.

A 2012 report from the European Commission ("Unconventional Gas: Potential Market Impacts in the European Union") states that, unlike the United States, *"Shale gas production will not make Europe self-sufficient in gas. The best-case scenario for shale gas development in Europe is one in which declining conventional production can be replaced and import dependence maintained at a level of around 60%"*. In November 2012, a divided European Parliament approved committee reports which recommended that policy on developing shale gas should be set by each member country for itself, rather than by the European Parliament (BBC, 2012). This was done despite intense lobbying by Gazprom for an EU-wide ban on hydraulic fracturing, perceived the potential

EU domestic shale development as a threat for both economic interests and geopolitical plans of Russia. At this point, we should also make a reference to the Former NATO Secretary-General Anders Rasmussen' statement accusing Russia of supporting environmental Non-Governmental Organizations (NGOs) that oppose the development of shale gas (The Guardian, 2014). Member States with shale gas resources have taken very different approaches. While some countries, such as Poland and the UK, are enthusiastic about shale gas development, others such as France, the Netherlands, Luxembourg, the Czech Republic and Bulgaria had bans or moratoriums in place against hydraulic fracturing. Moreover, public opinion on shale gas is divided, and varies greatly between Member States. On one hand, proponents argue that the risks are manageable and point to long-term economic benefits and reduced energy dependence from third countries such as Russia. On the other hand, opponents are concerned mainly about environmental impacts on water use and air (pollution), earthquakes, disruption of natural habitats, as well as disturbance of local communities by truck traffic and drilling noise (externalities). Addressing these environmental and social concerns is considered to be critical for the successful development of shale gas.

The opposing countries to the exploitation of shale resources should re-examine in the near future the possibility of exploiting these resources, as the development of -environmental friendly- mining techniques in the coming years will contribute to mitigating the environmental and social concerns within these countries. A long-term EU energy strategy should include the exploitation of shale resources, as it will significantly contribute to the enhancement of its energy security- reducing or at least keeping steady its import dependency- by increasing EU historic-low domestic energy production. This would keep oil and gas prices low for consumers challenging Russian domination of energy supplies and prices. Furthermore, shale-rich Eastern European Member States would better defend themselves against Kremlin's coercive pipeline politics, enhancing both their energy security and their national sovereignty. Moreover, the potential EU shale development will contribute to the stimulation of its recessionary economy by attracting large-scale and capital-intensive energy investments, which could contribute to the EU's return to economic growth with corresponding social benefits. Fracking industry has already generated thousands of jobs in recent past and is expected to generate plenty of jobs in near future.

Concluding, EU must first be integrated into issues of a long-term energy policy-strategy and then define a common clear-transparent legal framework for the development of shale resources, which will both aim to protect the environment and local communities

but on the other hand will speed up bureaucratic procedures relating to the shale investments.

5.1.2. Nuclear Energy

There is no coherent strategy on nuclear power in EU. Several important countries such as Italy and Austria do not have nuclear in their energy mix, while some countries (Germany by 2022, Belgium by 2025, Spain in 2028, and Switzerland in 2035) have decided to phase out nuclear. On the other hand, several countries have expressed interest in building new reactors (for instance the Netherlands, and Sweden) or in introducing nuclear in their mix (Poland, Turkey). However, it would be optimistic to see any substantial increase in nuclear power production in Europe post 2020, mostly because of high costs, but also due to phase-out decisions.

According to Maehlum (2013) nuclear energy is considered as one of the most environmentally friendly source of energy as it produces fewer greenhouse gas emissions during the production of electricity as compared to traditional sources like coal power plants. Also, even though the expense of setting up nuclear power plants is moderately high, the expense of operating them is quite low. Moreover, as solar and wind energy are dependent upon weather conditions, nuclear power plant has no such constraints and can run without disruption in any climatic condition. Finally, the amount of fuel required by nuclear power plant is comparatively less than what is required by other power plants as energy released by nuclear fission is approximately ten million times greater than the amount of energy released by fossil fuel atom.

On the other hand, radiation isn't easily dealt with, especially in nuclear waste and maintenance materials, and expensive solutions are needed to shield both people and the environment from its harm. Moreover, there is also fear of experiencing tremendous disaster as in the case of "The Chernobyl accident", the worst nuclear accident in the history. Its harmful effects on humans and ecology can still be seen today. More recently there was another accident that happened in Fukushima in Japan, causing serious environmental concerns.

To conclude, EU should examine the possibility of integrating nuclear development in its long term energy strategy, gaining benefits from nuclear rewards but at the same time taking all such preventive measures to mitigate its risks. Nuclear energy can be an

effective and stable energy option, contributing to enhancing energy security. For this reason, it should not be discarded as an option in advance.

5.2. The development of new gas pipelines and LNG regasification facilities

The European Commission seems to focus mainly on improving its regulatory framework. Yet the lack of physical interconnection necessarily limits market integration. To this dilemma, the Commission has to either examine if new infrastructure is required, or focusing on "debottlenecking"[34] existing infrastructure. There are increasing prospects that European consumers will benefit as the market enters a low-price era amidst competition between Russian, Norwegian, Qatari and US LNG. To improve the access of all Member States to LNG, the EU needs to develop the necessary infrastructure (upgrading existing or constructing new interconnections linked with new LNG regasification facilities) and simultaneously complete the internal market, allowing all Member States to access international LNG markets, either directly or via other Member States. The EU's overall LNG import capacity is significant enough to meet around 43 % of total current gas demand (Gas Information, 2016). The EU should fund infrastructure investments connecting its highly liquid-competitive north-western gas market – which can have access to several sources of gas including a number of terminals with substantial capacity to import LNG (see Table 14) – with southern and eastern market where suppliers are few and Member States are heavily dependent on a single gas supplier (Russia), and would therefore be hardest hit in a potential supply crisis (Ewi ER&S and EUCERS, 2016). Particularly, the littoral countries of Adriatic, Baltic and Black Sea do need LNG regasification facilities in order to make sure that both they can have access to a regional gas hub with a diverse range of supply sources, including LNG, and that the Central European landlocked countries would also take advantage of that reverse-flow liquidity. Based on the list of EU "projects of common interest", the LNG strategy includes a list of key infrastructure projects which are essential for ensuring that all Member States of the EU can benefit from LNG (European Commission, 2013).

[34] "Debottlenecking" is the process of identifying specific areas and/or equipment in oil and gas facilities that limit the flow of product (otherwise known as bottlenecks) and optimizing them so that overall capacity in the plant can be increased (Audubon Companies, 2014).

Table 14: EU LNG import facilities.

		Regasification		Storage	
Country	**Numb. of LNG Terminals**	**Nominal capacity (bcm per year of gas)**	**Total numb. of Vaporizers**	**Total capacity (tcm of LNG)**	**Total Numb. of Tanks**
Belgium	1	9.5	12	380	4
France	3	22.5	21	840	9
Greece	1	5.2	6	130	2
Italy	3	15.9	12	488	8
Lithuania	1	4.2	4	173	--
Netherlands	1	12.7	8	540	3
Portugal	1	8.0	7	390	3
Poland	1	5.0	--	160	2
Spain	6	63.4	43	3317	25
UK	4	56.5	35	2233	15

Source: EIA Gas Information (2016). *Abbreviations:* numb. =number, bcm=billion cubic metres, tcm=thousand cubic metres, LNG=Liquefied Natural Gas

6. Conclusion

The energy relations between EU and Russia could be described as an asymmetrical interdependence between them. This balance is particularly sensitive for both of them. From EU's perspective, the over-dependency on Russian energy commodities is threatening both its energy security and its ex-Soviet Member States' sovereignty as the latter are vulnerable to the Kremlin's potential economic-political leverage. From Russia's perspective, its economy's viability and hence its state's stability-cohesion is threatened by EU's energy liberalization and diversification attempts, along with growing global LNG industry, which are challenging Russia's dominance in the European energy market. Undoubtedly, there are conflicting geopolitical-economic interests and goals of both actors' strategy which shifted EU-Russia's relationship from a strategic-political relationship to a simplified commercial relationship.

Therefore EU needs to establish a common-unified EU energy policy, negotiating with one voice *vis-à-vis* Russia. Adopting a scheme for voluntary common purchasing of gas from Russia would be a first step in this direction. The EU should be in control of Russia's influence over its energy market. It should not be forgotten that Russia needs the EU, and not only for gas and oil revenues. With (i) demand decreasing in the short-term, (ii) Russia's position as a reliable partner-supplier questionable and (iii) the Russian economy in tatters, it is not unlikely to see Russia in the near future to take the right path of action in carrying out needed reforms internally and stopping aggression outside its borders. To conclude, the political will of the Member States to coordinate their energy policies and the availability of sufficient funds to implement infrastructure projects will be the key determinants of a successful Energy Union. On the other hand, if Member States precede their national-strategic interests against common aims, as in the case of Germany with the controversial project of Nord Stream II, then EU Energy Union would develop into a failure.

Bibliography

Adomeit, H. (2016). Germany, EU and Russia: The Conflict over Nord Stream 2. Centre for European Studies Policy Brief. Retrieved from: http://carleton.ca/ces/wp-content/uploads/Adomeit-policy-brief.pdf

Ambrosio, T. (2016). The rhetoric of irredentism: The Russian Federation's perception management campaign and the annexation of Crimea. *Small Wars & Insurgencies*, *27*(3), 467-490.

American Interest. (2015, March 3). Lithuania already hungry for US LNG. Retrieved from: http://www.the-american-interest.com/2015/03/03/lithuania-already-hungry-for-us-lng/

American Interest. (2016, June 24). Russia Prepares to Battle US LNG for Europe. Retrieved from: http://www.the-american-interest.com/2016/06/23/russia-prepares-to-battle-us-lng-for-europe/

Anderson, R. (2008). Europe's dependence on Russia gas: Perspectives and Recommendations for a long-term strategy. George C. Marshall. European Center for Security Studies. Occasional Paper Series, 19.

Audubon Company. (2014, August 21). Debottlenecking: What it is and how it can help optimize downstream processes. Retrieved from: http://www.audubooncompanies.com/debottlenecking-what-it-is-and-how-it-can-help-optimize-downstream-processes/

Baldwin, D. (1997). The concept of security. *Review of International Studies*, *23*, 5–26.

Balzer, H. (2005). The Putin thesis and the Russian energy policy. *Post-Soviet Affairs*, *21*(3), 210–225.

Barber, T. (2016, November 29). Bulgaria's reliance on Russian gas almost over. Financial Times. Retrieved from: https://www.ft.com/content/4a413060-9a07-11e6-8f9b-70e3cabccfae

BBC. (2012, November 20). MEPs divided over shale gas use. Retrieved from: http://news.bbc.co.uk/democracylive/hi/europe/newsid_9770000/9770726.st

Beckman, K. (2016, April 14). Can Nord Stream 2 be stopped? Energypost. Retrieved from: http://energypost.eu/can-nord-stream-2-stopped/

Bergamaschi, L. (2015, February 26). Does diversification of supply routes really deliver energy security? Euroactiv. Retrieved from: http://www.euractiv.com/section/med-south/opinion/does-diversification-of-supply-routes-really-deliver-energy-security/

Besemeres, J. (2016). *A difficult neighborhood: Essays on Russia and East-Central Europe since World War II*. 10. 141–167. ANU Press. The Australian National University.

Blagov, S. (2006). Illarianov Resignation Reduces Kremlin Debate on Economy, Energy Policy. *Eurasia Daily Monitor*. *3*(5). Retrieved from: https://jamestown.org/program/illarionov-resignation-reduces-kremlin-debate-on-economy-energy-policy/

BP. (2011). British Petroleum. BP Statistical Review of World Energy. Retrieved from: http://www.bp.com/content/dam/bp-country/de_de/PDFs/brochures/statistical_review_of_world_energy_full_report_2011.pdf

BP. (2016). British Petroleum. BP Statistical Review of World Energy. Retrieved from: https://www.bp.com/content/dam/bp/pdf/energy-economics/statistical-review-2016/bp-statistical-review-of-world-energy-2016-full-report.pdf

Buckley, N. (2016, September 28). Russia plays geopolitical Gazprom game. Financial Times. Retrieved from: https://www.ft.com/content/1bb6bd4a-84c8-11e6-a29c-6e7d9515ad15

Bugajski, J. (2004). *Cold Peace: Russia's New Imperialism*. Prager.

Cambridge Econometrics. (2016). A study on oil dependency in the EU. A report for Transport and environment. Retrieved from: https://www.transportenvironment.org/sites/te/files/publications/2016_07_Study_EU_oil_dependency.pdf

Chiodo, J., & Owyang, M. (2002). A Case study of a Currency crisis: The Russian Default of 1998. The Federal Reserve Bank of St. Luis. Retrieved from: https://files.stlouisfed.org/research/publications/review/02/11/ChiodoOwyang.pdf

Chung, F. (2014, December 18). The Cold War is back, and colder. News. AU. Retrieved from: http://www.news.com.au/finance/economy/the-cold-war-is-back-and-colder/news-story/ac7ca11a978305cb4b13b4bb64902cd7

CIA. (2016). Central Intelligence Agency. CIA World Factbook. Retrieved from: www.cia.gov

Cienski, J. (2006, November 24). Baltic lessons for EU in dealing with a resurgent Russia. Financial Times. Retrieved from: http://www.ft.com/cms/s/0/05ff71f8-7b60-11db-bf9b-0000779e2340.html?ft_site=falcon&desktop=true#axzz4Tvp4VcE

Coppola, F. (2014, December 1). Oil, Sanctions and Russian Politics. Forbes. Retrieved from: http://www.forbes.com/sites/francescoppola/2014/12/01/oil-sanctions-and-russian-politics/#72f5ff8d1ebd

Copsey, N. (2005). Popular Politics and the Ukrainian Presidential Election of 2004. *Politics*, 25(2), 99–106.

Curtis, G. E. (1996). *Russia: A country study.* Washington: GPO for the Library of Congress.

Danish Energy Association. (2011). Smart Grid in Denmark 2.0. Retrieved from: http://energinet.dk/SiteCollectionDocuments/Engelske%20dokumenter/Forskning/Smart%20Grid%20in%20Denmark%202.0.pdf

De Jong, S. (2016, August 11). Why Nord Stream II is not only Eastern Europe's problem. Atlantic Council. Retrieved from: http://www.atlanticcouncil.org/blogs/new-atlanticist/why-nord-stream-ii-is-not-only-eastern-europe-s-problem

De Meulemeester, B. (2015, July 23). How hub-based pricing is reshaping the EU gas market - even Spain. Energypost. Retrieved from: http://energypost.eu/hub-based-pricing-reshaping-eu-gas-market-even-spain/

EIA. (2015). US Energy Information Administration. Retrieved from: https://www.eia.gov/analysis/studies/worldshalegas/

EIA. (2016).US Energy Information Administration. Country Analysis Brief: Russia. Retrieved from: https://www.eia.gov/beta/international/analysis.cfm?iso=RUS

European Commission. (2012). Unconventional Gas: Potential Market Impacts in the European Union. Retrieved from: http://bookshop.europa.eu/is-bin/INTERSHOP.enfinity/WFS/EU-Bookshop-Site/en_GB/-/EUR/ViewPublication-Start?PublicationKey=LDNA25305

European Commission. (2013). Project Common Interest. Retrieved from: http://ec.europa.eu/energy/en/topics/infrastructure/projects-common-interest

European Commission. (2014). European Energy Security Strategy. Retrieved from: https://ec.europa.eu/energy/node/192

European Commission. (2016). Eurostat Energy Balances. Retrieved from: http://ec.europa.eu/eurostat/web/energy/data/energy-balances

European Commission. (2016). Towards Energy Union: The Commission presents sustainable energy security package. Retrieved from: http://europa.eu/rapid/press-release_IP-16-307_en.htm

European Council. (2015). Conclusions on the Energy Union. Brussels, 19 March 2015. Retrieved from: http://www.consilium.europa.eu/en/press/press-releases/2015/03/conclusions-energy-european-council-march-2015/

European Council. (2016). Outcome of the Council meeting.3505th Council meeting. Transport, Telecommunications and Energy. Brussels, 1, 2 and 5 December

2016. Retrieved from: http://www.consilium.europa.eu/en/meetings/tte/2016/12/01-02/

European Parliament. (2014). Shale gas and EU energy security. Retrieved from: http://www.europarl.europa.eu/RegData/etudes/BRIE/2014/542167/EPRS_BRI(2014)542167_REV1_EN.pdf

European Parliament. (2016). MEPs voice grave concerns about Nord Stream 2 project. Retrieved from: http://www.europarl.europa.eu/news/en/news-room/20160509IPR26345/meps-voice-grave-concerns-about-nord-stream-2-project

Ewi ER&S and EUCERS. (2016). Ewi Energy Research & Scenarios and European Centre for Energy and Resource Security. Options for Gas Supply Diversification for the EU and Germany in the next Two Decades. Retrieved from: http://www.ewi.research-scenarios.de/cms/wp-content/uploads/2016/10/Options-for-Gas-Supply-Diversification.pdf

Friedman, G. (2016, December 27). Low oil prices will make Russia more aggressive in 2017. Forbes. Retrieved from: http://www.forbes.com/sites/johnmauldin/2016/12/27/low-oil-prices-will-make-russia-more-aggressive-in-2017/#5d5113593d86

Gaidar, E. (2004). Recovery Growth and Key Features. *Russian Social Science Review*, *45*(2), 41–58.

Gavrilenkov, E., & Izdryadnova, O. (2003). General Trends in the Real Sector in the Reform Period. In E. Gaidar (Ed.), *The Economics of Transition, (*pp. 637–674). Massachusetts: The MIT Press.

Gazprom. (2013). Gazprom in figures 2008-2012: Factbook. Retrieved from: http://www.gazprom.com/f/posts/55/477129/gazprom-reference-figures-2008-2012-eng.pdf

Gazprom. (2016a). Investors / Capitalization. Retrieved from: http://www.gazprom.com/investors/stock/

Gazprom. (2016b). About Gazprom. Retrieved from: http://www.gazprom.com/about/

Gedmin, J. (2015, June 4). A short history of Russian Poisoning. The American Interest. Retrieved from: http://www.the-american-interest.com/2015/06/04/a-short-history-of-russian-poisoning/

Goldthau, A. (2008, January 29). Resurgent Russia? Rethinking Energy Inc. Policy Review. Hoover Institution. Retrieved from: http://www.hoover.org/research/resurgent-russia-rethinking-energy-inc

Green, D. A. (2016, June 14). Can the United Kingdom government legally disregard a vote for Brexit? Financial Times. Retrieved from: http://blogs.ft.com/david-allen-

green/2016/06/14/can-the-united-kingdom-government-legally-disregard-a-vote-for-brexit/?Authorised=false&_i_location=http%3A%2F%2Fblogs.ft.com%2Fdavid-allen-green%2F2016%2F06%2F14%2Fcan-the-united-kingdom-government-legally-disregard-a-vote-for-brexit%2F&_i_referer=https%3A%2F%2Fen.wikipedia.org%2F6666cd76f96956469e7be39d750cc7d9&classification=conditional_standard&iab=barrier-app

Harvey, F. (2014, June 19). Russia secretly working with environmentalists to oppose fracking. The Guardian. Retrieved from: https://www.theguardian.com/environment/2014/jun/19/russia-secretly-working-with-environmentalists-to-oppose-fracking

Hedberg, A. (2015, January 28). Europe's energy security - is the Energy Union the answer? Retrieved from: http://www.epc.eu/pub_details.php?cat_id=4&pub_id=5256

Hedenskog, J., & Larsson, R. (2007). Russian Leverage on the CIS and the Baltic States. FOI Swedish Defense Research Agency. Retrieved from : https://www.foi.se/vara-tjanster/fois-rapporter--publikationer/sammanfattning.html?reportNo=FOI-R--2280--SE

Henderson, J., & Mitrova, T. (2015). The Political and Commercial Dynamics of Russia's Gas Export Strategy. Oxford Institute for Energy Studies. Retrieved from: https://www.oxfordenergy.org/wpcms/wp-content/uploads/2015/09/NG-102.pdf

IEA. (2016). International Energy Agency. Gas Information 2016 edition. Retrieved from: http://wds.iea.org/wds/pdf/Gas_documentation.pdf

IMF. (2016). International Monetary Fund. World Economic Outlook Database. Retrieved from: https://www.imf.org/external/pubs/ft/weo/2016/01/weodata/download.aspx

Jegelevicius, L. (2016, March 23). Nord Stream 2: Trojan horse or guarantee of security. Natural Gas World. Retrieved from: http://www.naturalgasworld.com/nord-stream-2-trojan-horse-or-guarantee-of-security-28757

Judah, B. (2013). *Fragile Empire: How Russia fell in and out of love with Vladimir Putin*. Newhaven and London: Yale University Press.

Kang, S. & Park, Y. (2015). *The International Monetary System, Energy and Sustainable Development*. London and New York: Routledge.

Kantchev, G. & Malek, M. (2016, April 21). First US Gas Shipment En Route to Europe. The Wall Street Journal. Retrieved from: http://www.wsj.com/articles/first-u-s-gas-shipment-en-route-to-europe-1461253153

Kavadze A. & Kavadze, T. (2014). NATO expansion to the East: Georgia's way to NATO membership, perspectives and challenges. *Journal of Social Sciences*, *3*(2), 21-27.

Kottasova, I. (2016, October 14). Russia is planning for low oil prices for years. CNN Money International. Retrieved from: http://money.cnn.com/2016/10/14/news/economy/russia-budget-oil-price/

Kovacevic, A. (2009). The Impact of the Russia-Ukraine Gas Crisis in South Eastern Europe. Oxford Institute for Energy Studies. Retrieved from: https://www.oxfordenergy.org/wpcms/wp-content/uploads/2010/11/NG29-TheImpactoftheRussiaUkrainianCrisisinSouthEasternEurope-AleksandarKovacevic-2009.pdf

Kramer, A. (2006, October 27). Lithuania suspects Russian oil grab - Business - International Herald Tribune. The New York Times. Retrieved from: http://www.nytimes.com/2006/10/27/business/worldbusiness/27iht-embargo.3312013.html?pagewanted=all

Kvintradze, E. (2010). Russia's Output Collapse and Recovery: Evidence from the Post-Soviet Transition. IMF Working Paper. Retrieved from: https://www.imf.org/external/pubs/ft/wp/2010/wp1089.pdf

Larsson, R. (2006) Russia's Energy Policy: Security Dimensions and Russia's Reliability as Energy Supplier: Risks and trends in the light of the Russian-Ukrainian Gas Conflict 2005-2006. FOI, Swedish Defense Research Agency. Retrieved from: https://www.foi.se/reportsummary?reportNo=FOI-R--1905--SE

Leonard, M., & Popescu, N. (2007). A Power Audit of the EU-Russia Relations. Policy Paper. European Council on Foreign Relations (ECFR). Retrieved from: http://ecfr.3cdn.net/1ef82b3f011e075853_0fm6bphgw.pdf

Liuhto, K. (2010). Energy in Russia's foreign policy. Electronic Publications of Pan-European Institute. Retrieved from: https://www.utu.fi/fi/yksikot/tse/yksikot/PEI/raportit-ja-tietopaketit/Documents/Liuhto_final_netti.pdf

Luhn, A. (2016, January 25). Russia's GDP falls 3.7% as sanctions and low oil price take effect. The Guardian. Retrieved from: https://www.theguardian.com/world/2016/jan/25/russias-gdp-falls-37-as-sanctions-and-low-oil-price-take-effect

Maehlum, M. (2013, March 3). Nuclear Energy: Pros and Cons. Retrieved from: http://energyinformative.org/nuclear-energy-pros-and-cons/

Mazneva, E. (2015, October 23). Gazprom said to see its lowest Europe Gas Price in 11 years. Bloomberg. Retrieved from: https://www.bloomberg.com/news/articles/2015-10-23/gazprom-said-to-see-its-lowest-eu-gas-price-in-11-years-in-2016

Milanovic, B. (1998). Income, Inequality, and Poverty during the Transition from Planned to Market Economy. *World Bank Regional and Sectoral Studies*. Retrieved from: http://documents.worldbank.org/curated/en/229251468767984676/pdf/multi-page.pdf

Milov, V. (2016, March 16). How Sustainable is Russia's Future as Energy Superpower? Carnegie Endowment for International Peace. Session chaired by Kuchins, A., Summarized by Gibson, M., Retrieved from: http://www.carnegieendowment.org/events/index.cfm?fa=eventDetail&id=860&&prog=zru

Ministry on Energy of Russian Federation. (2010). Energy Strategy of the Russian Federation until 2020-Approved by Decree N°1715-r of the Government of the Russian Federation dated 13 November 2009

Mooney, C. (2014, December 12). The basic reason oil keeps getting cheaper and cheaper. The Washington Post. Retrieved from: https://www.washingtonpost.com/blogs/wonkblog/wp/2014/12/12/the-basic-reason-oil-keeps-getting-cheaper-and-cheaper/

Morelli, V. L. (2017). Ukraine: Current Issues and U.S. Policy. Congressional Research Service. Retrieved from: https://fas.org/sgp/crs/row/RL33460.pdf

Moscow Times. (2015, December 10). Over 2 million more Russian fall below poverty line. Retrieved from: https://themoscowtimes.com/articles/over-2-million-more-russians-fall-below-poverty-line-51186

Paque, K. (2015, September 25). Europe's energy security in the context of the Ukraine Crisis. 4 Liberty.eu. Retrieved from: http://4liberty.eu/europes-energy-security-in-the-context-of-the-ukraine-crisis/

Powell, W. (2016, December 9). Geopolitics cloud e European gas flow debate: Conference. Natural Gas World. Retrieved from: http://www.naturalgasworld.com/geopolitics-cloud-e-european-gas-flow-debate-comment-34842

Reuters. (2014, April 17). Putin admits Russian forces were deployed in Crimea. Reuters. Retrieved from: http://uk.reuters.com/article/russia-putin-crimea-idUKL6N0N921H20140417

Reuters. (2015, October 13). Exclusive: Gazprom to offer more gas at spot prices via Nord Stream I. Retrieved from: http://www.reuters.com/article/us-russia-gazprom-spot-idUSKCN0S71XS20151013

Reuters. (2016a, January 15). Exclusive: Russia likely to scale down China gas supply plans. Reuters. Retrieved from: http://www.reuters.com/article/us-russia-china-gas-exclusive-idUSKCN0UT1LG

Reuters. (2016b, June 22). Gazprom prepares cold reception for U.S. super-cooled gas. Reuters. Retrieved from: http://www.reuters.com/article/europe-gas-gazprom-idUSL8N19D37B

Roberts, A. (1999). NATO's "Humanitarian War" over Kosovo. *Survival*, 41(3), 102-123. Retrieved from: http://www.columbia.edu/itc/sipa/S6800/courseworks/NATOhumanitarian.pdf

Roberts, J. (2016). Completing Europe: Gas interconnections in Central and Southeastern Europe - An update. Atlantic Council's Global Energy Center & Dinu Patriciu Eurasia Center. Retrieved from: http://www.atlanticcouncil.org/images/publications/Completing_Europe_web_0824.pdf

Romanova, T. (2016, March 16). Russia 's Energy Strategy to 2030: Interview. Natural Gas World. Interviewed by Charles Ellinas. Retrieved from: http://www.naturalgasworld.com/russias-energy-strategy-to-2030-interview-28637

Russian Federation Federal Statistics Service. (2015). Social & Economic Indicators of the Russian Federation: 1991-2014. Appendix to the Statistical Yearbook of Russia.2015. Retrieved from: http://www.gks.ru/free_doc/doc_2015/year/pril-eng15.htm

Sabaliauskaite, G. (2000). Privatization in Lithuania: General Environment and Case Studies. Honors Projects. Paper 1. Retrieved from: http://digitalcommons.iwu.edu/busadmin_honproj/1

Sabitova, N., & Shavaleyeva, C. (2015). Oil and Gas Revenues of the Russia: Trends and Prospects. *Procedia Economics and Finance*, 27, 423-428.

Siddi, M. (2016). The EU's Energy Union: A sustainable Path to Energy Security? *The International Spectator*, *51*(1), 131-144.

Smedley, M. (2016, November 30). Clean EU energy means gas not coal: Eurogas. Natural Gas World. Retrieved from: http://www.naturalgasworld.com/quick-efficient-climate-gains-only-with-gas-says-lobby-34685

Smith, K. (2008). Russian Energy Policy and its Challenge to Western Policy Makers. Center for Strategic and International Studies. Retrieved from: https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/media/csis/pubs/080407_helsinki.pdf

Theisen, N. (2014). Natural Gas Pricing in the EU: From oil-indexation to a hybrid pricing system. Regional Centre for Energy Policy Research (REKK). Retrieved from: http://rekk.hu/downloads/projects/2014_rekk_natural%20gas%20pricing.pdf

Tikhomirov, V. (2000). *The Political Economy of Post-Soviet Russia*. Houndmills: Palgrave Macmillan.

Trenin, D. (2008). Energy geopolitics in Russia-EU relations, Pipelines, Politics and Power. The Future of EU-Russia energy relations. Edited by Barysch, K. Centre for European Reform. 15-24. Retrieved from: https://www.cer.org.uk/sites/default/files/publications/attachments/pdf/2011/rp_851-271.pdf

United Nations Comtrade Database. (2015). International Merchandise Trade Statistics. Country: Russian Federation. Retrieved from: https://comtrade.un.org/pb/CountryPagesNew.aspx?y=2015

Van Voren, R. (2015, January 6). Is Putin poisoning his opponents? Euromaidan Press. Retrieved from: http://euromaidanpress.com/2015/06/01/is-putin-poisoning-his-opponents/

Vorloeper, H. (2016, September 30). Five questions about Nord Stream 2- Opinion. Enerpo Journal. Retrieved from: https://enerpojournal.com/2016/09/30/five-questions-about-nord-stream-2-opinion/

Weiss, C. (2013, July 13). European Union's Nabucco pipeline project aborted. World Socialist Web Site. Retrieved from: https://www.wsws.org/en/articles/2013/07/13/nabu-j13.html

Welt, C. (2005). Causes of the Rose Revolution: Lessons for Democracy Assistance. United States Agency for International Development. Retrieved from: https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/media/csis/pubs/ci.causesroserevolution.03.05.pdf

WHO. (2006). World Health Organization. Interpersonal Violence and Alcohol in the Russian Federation. Policy briefing. Violence and Injury Prevention Program WHO Regional Office for Europe. Retrieved from: http://www.euro.who.int/__data/assets/pdf_file/0011/98804/E88757.pdf

Zvonareva, M. (2015, September 28). Gazprom: Lost illusions and humble hopes? Natural Gas World. Retrieved from: http://www.naturalgasworld.com/gazprom-lost-illusions-and-humble-hopes-25534

Appendix

Table A1: Russia's major oil pipelines.

Facility	Status	Capacity (mbd)	Length (miles)	Diameter (inches)	Market/Destination
Baku-Novorossiysk	Operating	0.1	830	21	Novorossiysk port on the Black Sea
Baltic Pipeline System I	Operating	1.3	730	28-40	Primorsk port in the Gulf of Finland
Baltic Pipeline System II	Operating	0.6	620	40-42	Ust-Luga port on the Gulf of Finland
Caspian Pipeline Consortium	Operating	0.7 (planned phased expansion to 1.3)	940	40-42	Novorossiysk Port
Druzhba	Operating	1.2-1.4	3957	17- 40	Europe
Eastern Siberia-Pacific Ocean (ESPO)	Operating	ESPO-1—1.2 currently, 1.6 by 2020 ESPO-2—0.5 currently, 1.0 by 2020 Daqing spur—0.3 currently, 0.6 by 2018	ESPO-1-1713 ESPO-2-1300 Daqing spur: 656	ESPO-1-42-48 ESPO-2-42-40 Daqing spur-28	Kozmino port with a spur to Daqing-China
Kuyumba-Taishet	Operating	0.16	440	21-28	Asia-Pacific region via the (ESPO) pipeline
Purpe-Samotlor	Operating	0.5	270		Asia-Pacific region via the (ESPO) pipeline
Zapolyarye-Purpe	Commissioning	0.6 (expandable to 0.9)	300	40	Asia-Pacific region via the ESPO pipeline

Source: US Energy Information Administration (2016). Abbreviation: mbd=million barrel per day

Table A2: Russia's major gas pipelines.

Facility	Status	Annual Design Capacity (bcm)	Onshore Section (miles)	Offshore Section (miles)	Diameter (inches)	Operat Press. (atm.bars)	Compressor Stations	Markets/ Destination
Blue Stream	Operating	16	232	246	Mainland: 55 Mountain.: 47 Submarine: 24	250	(3) Main station- "Beregovaya":150 Mw cap.	Turkey via the Black Sea
Dzhubga-Sochi	Operating	3.8	17.5	159.5	20R	98	(6)	Russia
Gryazovets-Vyborg	Operating	55	570	0	55	100	(6) Main station "Portovaya": 366 Mw	Russia's Northwest region
Minsk-Vilnius–Kaunas-Kaliningrad	Operating	2.5	91		Pip.1:19.7 Pip.2:27.5	54	(6) Main station "Jauniunai": 34.5 Mw	Belarus & Lithuania
Nord Stream	Operating	55	1.24	759	48	220	(1)"Portovaya":366 Mw	Germany & Northern Europe via the Baltic Sea
Northern Tyumen Regions (SRTO)–Torzhok	Operating	varies between 20.5 - 28.5 bcm at various sections	1367	44	Above ground:56 Submerged:47	120	(13)968 Mw aggr.cap.	Western Russia & Europe
Sakhalin-Khabarovsk - Vladivostok	Operating	30	1118		48	100	(14) "Sakhalin" main station: 32Mw cap.	Eastern Russia /potent exports to Asia via LNG
South Corridor Pipelines	Under construction	63	1557		32	284.5	(10) 1516Mw aggr. cap.	Europe via Turkish Stream
Turkish Stream	Planning	63	112	560	32	277.4	(4) Main station: "Russkaya": 448 MW	Turkey- Southeast Europe via the Black Sea
Pochinki-Gryazovets	Operating	36	404		56	74	(6) 580 Mw aggr cap.	Russian Northwest and Central regions
Power of Siberia	Under construction	38	1864		56	98	(8)	China
Yamal Europe	Operating	33	2607		56	84	(31) 2399 Mw aggr.cap.	Poland, Germany & Europe

Source: US Energy Information Administration (2016). Abbreviations: aggr.cap. =aggregate capacity; atm.bars=atmospheric bars; bcm=billion cubic meters; Mw=Megawatt; Pip. = pipelines